GARDENING in CONTAINERS

flowers, shrubs, small trees
Petunias in hanging containers and in large and small containers on the patio supplement the border of petunias next to the house.

(This photograph and the ones on page 5 were provided by Pan-American Seed Co., West Chicago.)

This circular was prepared by M. C. Carbonneau, Associate Professor of Horticulture and Extension Specialist in Floriculture.
GARDENING IN CONTAINERS

Growing plants in containers is definitely not a new method of gardening in the Midwest. Many immigrants brought to this country the custom of growing geraniums, petunias, vines, and other annuals in outside containers such as window boxes and urns.

But in recent years, a new concept of container gardening has become a part of contemporary living. Many homes are now designed to put the homeowner in immediate touch with the outdoors and plant life. Container-grown plants are arranged so that a person can have plant materials at his fingertips as soon as he walks out onto his patio.

Growing plants in decorative outdoor containers is also becoming popular with apartment dwellers who have terraces or balconies. Evergreens, small flowering trees, and large foliage and flowering plants can add life and warmth to apartment living.

SELECTING PLANTS

A list of annuals, deciduous trees and shrubs, and evergreens suitable for planting in containers is given on page 4.

Recommended foliage plants and evergreens include dwarf or slow-growing varieties that will not become overgrown in a short time. For flowering plants, annuals are recommended because of their extended flowering season. Most perennials have only a short blooming period. The choice of flower colors should depend on the color of the house and other background materials.

SELECTING CONTAINERS

Manufacturers of garden accessories have introduced containers in a variety of sizes, shapes, and materials. Traditional redwood tubs, barrels, concrete urns, jardinieres, and large clay pots are still the most popular containers. Some of the newer materials include fiberglass, plastics, metal alloys, glazed ceramic, and textured concrete.

With so many kinds of containers available, it should be easy to find one that will fit into your particular situation. The design should blend into the setting without adding any appearance of clutter. The color of the container should complement the other colors of the environment, such as that of the house, patio construction material, fences, or other major construction features.
### PLANTS COMMONLY USED IN CONTAINERS

**Tender bedding or annual plants**

*For sun:*

<table>
<thead>
<tr>
<th>Plant</th>
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<tbody>
<tr>
<td>Ageratum</td>
<td>Nasturtium</td>
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<tr>
<td>Asparagus sprengeri</td>
<td>Periwinkle <em>(trailing)</em></td>
</tr>
<tr>
<td>Sweet alyssum</td>
<td>Petunia <em>(cascade or balcony)</em></td>
</tr>
<tr>
<td>Coleus <em>(cutting-grown)</em></td>
<td>Phlox <em>(annual)</em></td>
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<tr>
<td>Dracaena</td>
<td>Portulaca</td>
</tr>
<tr>
<td>Dusty miller</td>
<td>Snapdragon <em>(dwarf)</em></td>
</tr>
<tr>
<td>Geranium</td>
<td>Verbena</td>
</tr>
<tr>
<td>Ivy, English</td>
<td>Zinnia <em>(dwarf)</em></td>
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<tr>
<td>Lantana</td>
<td>Vinca vine</td>
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<tr>
<td>Marigold <em>(dwarf French)</em></td>
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*For shade:*

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<thead>
<tr>
<th>Plant</th>
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<tbody>
<tr>
<td>Begonia <em>(tuberous)</em></td>
<td>Hosta</td>
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<tr>
<td>Begonia <em>(wax or fibrous-rooted)</em></td>
<td>Impatiens</td>
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<tr>
<td>Browallia</td>
<td>Ivy, English</td>
</tr>
<tr>
<td>Caladium</td>
<td>Lobelia</td>
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<tr>
<td>Coleus <em>(seed or cutting)</em></td>
<td>Tradescantia</td>
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<tr>
<td>Ferns</td>
<td>Vinca vine</td>
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<tr>
<td>Fuchsia</td>
<td>Pansy</td>
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<tr>
<td>Geranium <em>(ivy-leaved)</em></td>
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### Deciduous trees

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<th>Plant</th>
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<tr>
<td>Birch</td>
<td>Honeylocust</td>
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<tr>
<td>Dogwood</td>
<td>Mountain ash</td>
</tr>
<tr>
<td>Flowering crabapple</td>
<td>Oriental flowering cherry</td>
</tr>
<tr>
<td>Ginkgo</td>
<td>Plum <em>(red leaf)</em></td>
</tr>
<tr>
<td>Goldenraintree</td>
<td>Redbud</td>
</tr>
<tr>
<td>Hawthorn</td>
<td>Sumac</td>
</tr>
<tr>
<td>Japanese maple</td>
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### Deciduous shrubs

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<thead>
<tr>
<th>Plant</th>
<th>Plant</th>
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<tbody>
<tr>
<td>Azalea <em>(Chinese)</em></td>
<td>Japanese flowering quince</td>
</tr>
<tr>
<td>Barberry</td>
<td>Potentilla</td>
</tr>
<tr>
<td>Bayberry</td>
<td>Roses <em>(floribunda and hybrid tea)</em></td>
</tr>
<tr>
<td>Forsythia <em>(dwarf)</em></td>
<td>Viburnum</td>
</tr>
<tr>
<td>Hydrangea</td>
<td></td>
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</tbody>
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### Evergreens

<table>
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<tr>
<th>Plant</th>
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<tbody>
<tr>
<td>Arborvitae</td>
<td>Piers</td>
</tr>
<tr>
<td>Azalea</td>
<td>Pines <em>(dwarf ornamental varieties)</em></td>
</tr>
<tr>
<td>Boxwood</td>
<td>Rhododendron</td>
</tr>
<tr>
<td>Euonymus</td>
<td>Spruce <em>(dwarf)</em></td>
</tr>
<tr>
<td>Holly <em>(American and Japanese)</em></td>
<td>Yew <em>(Japanese and Anglo-Jap)</em></td>
</tr>
</tbody>
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Many containers will have drainage holes. If holes are not present, be sure the container is deep enough to allow for ample drainage from the plant root area (page 8). Often a liner or container with drainage holes is placed inside a decorative container without drainage holes.

It is not advisable to use tractor tires, old sinks, bathtubs, or other such discarded items for containers. These do little to improve the environment around a house — in fact, they usually detract from the landscape setting.

White cascade petunias do well in a large cast concrete container.
SOIL MIXTURES

The success of gardening in pots, tubs, and urns depends primarily on the soil that is used. Soil can of course be taken from the home garden, but most of the garden loam in this part of the country has a high silt and clay content, making it rather "heavy" for use in containers. For best results, the soil should be mixed with organic materials and with inorganic materials or additives that will improve drainage.

Commonly used organic materials include sphagnum peat moss, leaf mold, compost, and well-rotted manure. Inorganic materials include coarse sand, vermiculite, perlite, and calcined clay.

The proportions of soil to other additives will vary both with the basic soil type and with the kind of plant to be grown. In most situations, the following mixture makes a good potting soil:
1 part garden soil (silt or clay loam)  
1 part organic matter  
1 part coarse sand or other inorganic material

If the garden soil is sandy, 2 parts of soil can be mixed with 1 part organic matter and 1 part inorganic additives.

It is recommended that bone meal or superphosphate be incorporated into either of the above mixtures. Add 2 tablespoons of bone meal or superphosphate to each gallon of soil mixture; or one 4-inch clay potful of the bone meal or superphosphate to each wheelbarrow of soil.

If the soil is very acid in reaction, finely ground agricultural limestone should also be added to the mixture. The rates are the same as for the bone meal or superphosphate — that is, 2 tablespoons of limestone to each gallon of soil, or one 4-inch clay potful of limestone to each wheelbarrow of soil.

Be sure the soil is mixed thoroughly so that the additives are incorporated throughout the potting mixture.

Some plants need special soil mixtures. Ferns, tuberous-rooted begonias, camellias, and gardenias, for example, all require soils that are high in organic matter. For these plants, use a mixture that consists of 1 part soil, 2 parts organic matter (preferably sphagnum peat moss), and 1 part inorganic additives.

Sterilization or pasteurization is advisable to rid the soil mixture of any weed seeds or disease organisms that may be present. “Do-it-yourself” methods of sterilization are described in Illinois Extension Circular 793, “Soil Sterilization Methods for the Indoor Gardener.” (This may be obtained by writing to the Publications Office, 123 Mumford Hall, Urbana, Illinois 61801.)

If you need a large quantity of soil (1 or 2 bushels) you may find it rather difficult to sterilize that much at home. It would be better to buy the sterilized soil mixture at a florist shop or garden center. For very large containers or planter boxes, however, the cost of buying sterilized prepared soil would usually be prohibitive. It is suggested that you prepare the soil as recommended above but eliminate the sterilization unless root and stem diseases have been a serious problem. In that situation, it would then be advisable to purchase sterilized soil.

If containers are replanted each spring, the soil should be changed first. This is recommended to insure well-drained soil that is not overly compacted or carrying diseases from the previous year.
PLANTING

Tender plants. Adequate drainage is essential. Drainage material should be placed in the bottom of every container. This is especially important if the container does not have drainage holes. Some of the more common drainage materials are broken clay flower pot pieces, coarse gravel, or pebbles.

The depth of drainage materials will vary with the container. In containers without drainage holes, drainage material should be one-fifth to one-fourth the depth of the container. If the container does have holes, about 2 or 3 inches of drainage material should be placed in the bottom.

It is usually recommended that the larger drainage material be covered by a piece of burlap, a thin layer of fiberglass, or a layer of sand, vermiculite, or perlite. This will keep the soil from washing into the drainage material or clogging the drainage holes.

While choosing a good soil mixture is vitally important, it is just as important to use the soil correctly. Before planting, be sure that the soil in the container is thoroughly moistened and that there are no large dry “pockets.” Such dry areas will cause roots to dry out and plant material to sink when water is applied. The soil will also settle, leaving too much space between the top of the soil and the rim of the container.

The soil should not be dripping water when planting is done, but it should be moist enough to hold a “ball” shape when squeezed in one’s hand. At the same time, it should be dry enough that the ball

Drainage material should fill the bottom one-fifth to one-fourth of containers without drainage holes (left), and the bottom 2 or 3 inches of containers with holes (right).
Avoid planting too deep; top roots should be $\frac{1}{2}$ to 1 inch below the surface.

formed by squeezing the soil will break into a crumbly mass when dropped a few feet onto a tabletop.

Correct planting depth is also important. Many gardeners tend to bury the plants too deep in the soil. This always interferes with future growth. Plant roots require air to grow rapidly. Annuals, and most other plants as well, grow best when the greater mass of roots is within the top 2 or 3 inches of the soil surface.

The plants should be placed in the soil so that the top roots are no deeper than $\frac{1}{2}$ to 1 inch below the soil surface, and then the soil should be firmed around the roots. If an occasional plant falls or leans over after the first watering, this is usually an indication that planting is at proper depth.

Before planting, inspect the plant roots. They are in full view when the plants are removed from the clay or plastic pots that they were started in. If the soil ball is a mass of roots, some of the roots at the base of the ball should be loosened to bring them into greater contact with the soil in the container.

Small plants in peat or fiber pots are planted with the fiber or peat surrounding the roots. It is, however, advisable to remove the bottom of the pot, and also the rim above the soil level of the plant ball. The bottom of the pot is removed to insure proper water drainage out of the soil ball. Removing the rim keeps excess water from collecting on the surface of the soil after planting.
Remove the bottom and the rim of peat pots before planting.

**Larger plant materials.** Drainage and soil preparation, as described under “Tender plants,” are especially important when planting ornamentals such as small trees, deciduous shrubs, and evergreens. These plants are not usually replaced each year, so it is essential to pot them correctly.

It is also important to provide protective materials in containers that are to stay outdoors all the time. The sides of large concrete cast containers need to be lined with an insulating material that will protect them from expansion or contraction of the soil ball during the winter. Pads of fiberglass, styrofoam, and foam rubber are all suitable. The pads should be 1 to 2 inches thick for containers less than 3 feet in diameter, and 3 to 4 inches thick for larger containers.

Containers need to be large enough to hold the root ball and leave room to place 3 to 4 inches of soil around the ball.

If plants are purchased in cans, baskets, or papier-maché pots, these containers should be carefully removed to keep the soil ball intact. *Do not try to pull the plants out of the containers.* This breaks the soil balls and roots, permitting the air to penetrate the ball and dry the roots. Plants bought in plastic or clay pots can be easily removed by
tapping the rim of the pot on a firm surface. If the roots are wrapped in burlap, the burlap should be folded back or cut away from the top of the root ball, but it does not have to be removed.

**Pot-in-pot.** Another method of planting is the pot-in-pot method, which is quite simple. Moist sphagnum peat moss is placed in the bottom of the outside container. The plant material, pot and all, is placed on top of the peat moss, and additional peat moss is placed around the pot. The peat moss will hold moisture and help to keep plants moist for several days. It also acts as an insulator, reducing water loss from the sides or bottom of the pot it encases.

The pot-in-pot method has a number of advantages. It is especially useful for planting large containers with a wide variety of plants. One plant can then be removed without disturbing the others. This method is good for displaying flowering plants for special occasions, or plants that flower only a short time. It is also used when placing plant material in precious metal or other containers that can be damaged by soil.

**CARE RIGHT AFTER PLANTING**

Immediately after planting, enough water should be applied to thoroughly soak all the soil in the container. If the container has drainage holes, water should be seeping from the holes. When drainage holes are lacking, you can probe the soil with a trowel or other implement to determine whether the water has penetrated to the drainage material in the bottom of the container. If too much water has been added, so that excess is standing on the soil surface or drainage is too slow, it may be necessary to tip over the container to get rid of the extra water. A starter fertilizer obtainable at a garden center or nursery may be applied with the first watering. Starter fertilizers are especially recommended for tender annuals.

Heavy watering will settle the soil around the roots, so that more soil may have to be added to the container after the initial watering. Plants are likely to wilt after planting, so it is usually a good practice to keep movable containers out of the wind or sun for a few days until the roots are established. If containers cannot be moved, loosely cover the new plants with moist burlap, newspaper, or other light material. Misting or syringing the covered plants several times a day will also help to keep them from wilting severely.

If containers are planted when there is still danger of frost, be sure
to protect the plants if even a light freeze is forecast. Many plants will freeze in early spring although a light frost at other times of the year would not harm them. The plants can be covered with newspaper, cardboard, or heavy cloth. Plastic covering should be used only if it is removed before the sunshine can heat the plants rapidly in the early morning. Whatever the covering, it should not be allowed to touch the plants. The covering can be kept off the plants by use of supports.

If you see that the plants are frosted, sprinkle or syringe them in the early morning to remove the frost and allow them to warm gradually.

Fertilizing on a regular basis should begin 5 to 10 days after planting. Container-grown plants usually require more fertilizing than garden plants. The soil in containers is usually a little warmer than garden soil early in the season, making for earlier and more rapid root growth in containers. Also, fertilizer nutrients are leached out of the containers as the result of frequent watering.

A soluble fertilizer is usually recommended (page 13).

GENERAL SUMMER CARE

Watering. Although watering usually determines the success or failure of your container gardening, it is impossible to lay down hard-and-fast rules about timing or size of applications.

One thing that is certain is that soil in containers will dry faster than the soil in adjacent garden areas. The soil surface and the sides of the containers are all areas of exposure and quick drying. In sunny or windy weather, small containers should be checked several times a day. Larger containers should be checked at least once a day although the larger soil mass will not dry out as quickly as the soil in small containers.

Do not depend on a rain — even a heavy one — to provide enough water. The foliage of the plants will often cause the rain to run off without saturating the soil. Locating containers in protected areas of patios or under overhangs will also cut down on the amount of moisture that they receive during a heavy rain.

Whenever the soil is dry, enough water should be applied to moisten the soil throughout the container. Experience with several waterings will help you determine the correct amount to apply. If the container has drainage holes, apply enough water that it seeps from
the holes. Saucers under these containers should be emptied after the water has completely drained out of the container.

Containers without drainage holes are more difficult to water correctly. Although it is necessary to moisten the whole soil mass, it is very easy to overwater and have excess water in the container. If this happens, the container can be tipped on its side to get rid of the extra water. You can use a trowel or spatula to check the moisture in the bottom half of the container.

As a general rule, it is better to keep the containers, especially those without holes, a little dry rather than too wet.

A large sprinkling can is useful for watering or for applying fertilizer solution. A soaker hose can be used to thoroughly soak the soil in large containers. Hose and nozzle waterings are not usually recommended because it takes too long to thoroughly water the soil, and the tops of the plants get too wet.

Remember, sun patterns change throughout the growing season. Containers that need constant watering in the spring and early summer may not be exposed to as much sun during the late summer and early fall. On the other hand, as plants grow, the soil will dry out faster, increasing the need for watering. The situation is further complicated by the fact that some plants do not wilt as quickly or as obviously as others.

If a soil high in organic matter becomes excessively dry, two or three consecutive waterings may be required to thoroughly moisten it.

Give each container special attention until you find the water requirements necessary for good plant growth.

Fertilizing. A constant supply of nutrient elements is needed in the confined soil areas of the containers. In recent years, fertilizer manufacturers have introduced concentrated products that are soluble in water and are very easy to apply. Used according to manufacturers' directions, these materials will insure rapid growth and flowering of plants in containers.

Fertilizer materials vary in analysis. Frequency of use depends on the analysis and also on the amount applied and the growth of the plant. The soil should be moist when fertilizer is applied. This means that an application of plain water should precede the application of the fertilizer solution.

Mulching. Peat moss, shredded bark, or other mulching material should be applied to the soil surface of containers a week to 10 days
after planting. A mulch will help both to insulate the soil from excessive drying and to keep it from being compacted by frequent waterings or heavy rains. Mulching materials also add to the attractiveness of the container or planting box.

**Pinching and pruning.** Most plants need some pruning and shaping during the growing season. The most obvious task is to remove dead or faded flowers. This must be done regularly to keep up the appearance of the plants and to encourage the development of more flowers.

Long trailing stems, such as those on trailing petunias and geraniums, should be pruned back at regular intervals during the growing season. This will encourage more flowering stems to develop.

Deciduous trees and shrubs should be pruned early in the spring before growth starts. Periodic pruning during the summer may be necessary to shape the plants. Any heavy pruning of spring-flowering shrubs should be done after flowering in the spring, to be sure that the plants will not be overgrown.

Evergreens are usually pruned after the new spring growth has hardened, in order to keep a formal appearance. Very heavy pruning, however, is usually done in the early spring so that the new growth can fill in voids in the plant.

**Moving containers.** When violent storms occur during the growing season, movable containers should be shifted to protected areas so that the plants will not be damaged by the wind and beating rain or hail.

During periods of prolonged heat and drought, it is recommended that plants be moved into semi-shade to reduce severe drying of the soil and the plants.

Plants that require full sun or shade should be moved into the most favorable growing conditions when the sun patterns change during the growing season. Plants such as geraniums or petunias may stop flowering if they remain in shaded locations for prolonged periods.

During spring and fall, when frost is likely to occur, it is often easier to move containers into protected areas than to try to provide adequate cover for the plants.

Many homeowners keep movable containers on platforms with castors so that the containers can be moved about the patio, deck, or porch at will.

**Vacation time.** Since the soil and plants in containers dry out
rapidly, it is necessary to make plans for their care while you are on vacation. Move the containers into a covered area, a light garage, or a protected outdoor area. A friend or neighbor will usually be glad to water the plants if you give him some idea about the amounts and frequency of waterings. Be sure the plants are well fertilized before you leave, so your neighbor won’t have to take care of this task.

WINTER CARE

Permanent planters, raised beds, and large containers (with perennials, deciduous trees or shrubs, or evergreens) need little preparation for winter. The main thing is to be sure that the soil is thoroughly moistened before the temperature drops below freezing.

During warm periods, check these containers periodically, and water them if the soil is not frozen and is dry. Planters attached to a heated building and protected by a large overhang are particularly likely to be thawed a good part of the time during the winter. When watering, be sure that the roots are moist. A 2- to 3-inch mulch of peat moss, shredded bark, cocoa bean hulls, or similar material will help prevent excessive drying during the winter.

Movable containers with perennials, small trees, or evergreens should be placed in protected locations such as outdoor storage areas or a light, cold garage. Watering should be minimal during the dormant season. If spring-flowering bulbs such as tulips, hyacinths, and narcissus are planted in these containers, special care is needed to keep the whole soil mass from freezing. Either mulching or a very well protected, cool (35°-40° F.) storage area is necessary.

Ceramic, plastic, or metal containers for annuals or other tender material should be emptied after frost has killed the plants. These containers should not be left outdoors during the winter unless the soil has been removed. If stored outdoors, they should be placed on their sides so that water will not collect inside to freeze and cause damage.

The soil should be left in wooden containers, such as barrels or tubs, that are held together by metal bands. If the soil is removed, the wood dries and shrinks and these containers fall apart. Planters made of wood but held together with nails or screws will also shrink and crack during storage if soil is not left in them.

It is sometimes possible to rent space in a greenhouse during the winter to store large specimen plants that are too big to keep in the home. The plants are watered and fertilized regularly during the winter and are actively growing in the spring.
Some other publications about flowers from the Illinois Cooperative Extension Service:

- Chrysanthemums for the Home Garden (Circular 883)
- Geraniums for the Home and Garden (Circular 904)
- Flowering Annuals for Sun and Shade (Circular 930)
- African Violets (Circular 942)
- Petunias for Color (Circular 962)
- Care of Flowering Potted Plants — Chrysanthemums, Poinsettias, Azaleas, Lilies, Hydrangeas, Potted Bulbs (Circular 980)

The above publications may be obtained from your county extension adviser. Or you may write to the Agricultural Publications Office, 123 Mumford Hall, Urbana, Illinois 61801.