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## Home Propagation of Ornamentals

A. L. Ford

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South Dakota State College  
Extension Service  
A. E. Anderson, Director  
Brookings, S. D.

## *Beautification is an Asset*

This state is just coming out of the pioneer stage. During the pioneering period all the energies and thoughts of the farmer have been devoted to making a living for himself and his family. That period is now a matter of history and South Dakota people are paying more attention to the better and finer things connected with rural life. The demand for home-grounds beautification is increasing rapidly.

Every home, whether in town or country, presents some sort of picture to the passerby. This picture may be pleasing, attractive, and inviting, or it may be bleak, barren, and even ugly. Every unlandscaped home in South Dakota, be it an humble cottage or a pretentious mansion, can be made attractive by the planting of trees, shrubs, vines, flowers and lawns. A few dollars worth of the correct nursery stock planted in the proper place will accomplish wonders.

One's first impression of a person is gained by the appearance of the place in which he lives. Pick out a neat attractive home and nine times out of ten you have picked a family of good wholesome folks who are a distinct asset to the community in which they live.

# Home Propagation of Ornamentals

A. L. Ford

Extension Horticulturist

Although it is true that many ornamentals can be propagated at home, the reader should not overlook the fact that there is a place for the commercial nurseryman and florist. These commercial institutions are absolutely essential to the proper advancement of a community along outdoor beautification lines. Nurserymen and florists have the expensive equipment necessary for the propagation of certain ornamentals that the average home cannot afford. When the layman realizes the amount of time, labor, and equipment necessary to propagate some of our common ornamentals, he wonders how they can be sold for such a remarkably low price. The reader should therefore understand it is not the purpose of this circular to take from the commercial propagator the business that he so rightfully deserves.

Ornamentals produced through propagation at home as a rule are not quite as nice as those purchased from the nursery. There is a place for this home propagation, however. During so-called "hard times" people cannot afford to purchase ornamentals. Under such conditions we believe it better for the public to progress by propagating their own ornamentals rather than stand still waiting for better times when they can purchase them. The home propagation of ornamentals makes it possible to increase certain desired plants, to exchange plants with neighbors, and to use certain native ornamental stock which grows wild. Some ornamentals can be propagated so easily that one would not think of going to a commercial propagator to attain the desired increase.

## Methods of Propagation

For the convenience of the reader, the different common methods of plant propagation are listed below. All plants considered in this circular, from the largest tree to the smallest annual flower, can be propagated by one or more of these methods.

**Seed.**—This is the common method used for propagating most trees and all of our annual flowers.

**Cuttings.**—There are three classes of cuttings in plant propagation: (1) softwood cuttings, (2) hardwood cuttings and (3) root cuttings. Among perennial plants, cuttings as a rule produce mature plants more quickly than from seed. Certain ornamentals will not "come true" from seed, therefore cuttings or division must be used.

**Layering.**—There are four types of layering: Common, continuous, serpentine, and mound layering. Most of the perennial vines and many of the shrubs can be readily propagated by this method. It consists of "laying down" part of the plant for reproductive purposes.

**Division.**—This method is commonly known as splitting. Any shrub or perennial that has the habit of forming a crown from which numerous shoots spring can be multiplied by taking up the plant, splitting it up into two or more pieces and replanting. This is known as division.

### Propagation by Seeds

**Trees.**—Most of our trees with the possible exception of the poplars and willows are usually propagated by seed. By consulting the table in this circular under the heading TREES, the reader will find the best method of propagating our common trees from seed. Some tree seeds, especially those with hard coats, are stratified to insure good germination. Stratification consists in fully exposing the seeds to the action of the weather. The common practice is to place the seeds in shallow boxes between alternate layers of sand. These boxes are then covered with screen to protect the seeds from rodents and buried out of doors in a pit even with the surface of the soil to weather over winter. These stratified seeds are then planted as soon as the soil is workable in the spring.

Some tree seeds such as American elm or Chinese elm should be sown as soon as they are ripe in the spring.

Amateurs should not attempt to propagate evergreens because of the special equipment necessary for success.

**Shrubs.**—Few shrubs can be easily propagated at home by seeds. There are some varieties however, such as the American cranberrybush, nannyberry, honeysuckle, sumac, juneberry, buffaloberry, cotoneaster,

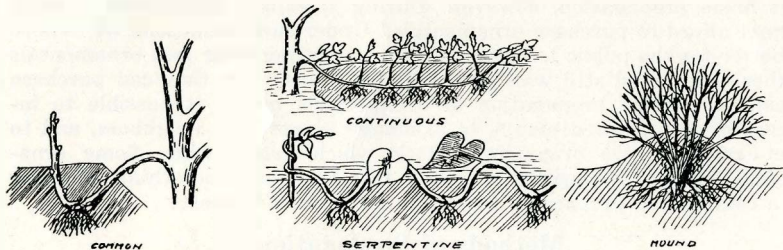


Fig. 1.—Types of layering

and Japanese barberry that can be grown from seed. This should be attempted only by those who understand the propagation of plants. At home, shrubs are more easily propagated by cuttings, layering, or division.

**Perennial and Biennial Flowers.**—The cheapest way to get a start with most of the common varieties of perennial and biennial flowers is with seed. Almost without exception, perennials will not produce blooms from seed until the second year. During the first season's growth from seed, the young plants expend all their energy in producing a root system and top. It can be readily seen that these young perennials during the first season's growth do not need much room. To save ground and lessen the labor required for care and watering of the young plants during the first year, the seed should be sown rather thickly in small seed beds. A seed bed three feet square will easily support two or three hundred of these young plants during the first year.

A full season's growth is not necessary the first year for most perennial flowers to produce bloom the second year. It is therefore recommended that the seed be planted during the latter part of July or the fore part of August in seed beds. These seed beds should be located in

a spot that is shaded during the heat of the day. A good place is under overhanging shrubbery. If such places are not available, artificial shades of burlap can be placed over the beds with enough space underneath for good air circulation. These seed beds should be kept moist at all times

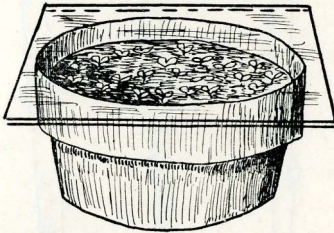


Fig. 2.—Seed germination under glass

by artificial watering during dry weather. In the fall, water should be withheld to allow the plants to harden off as this will make them less subject to winter killing. The young plants should be wintered in the seed beds under a mulch of leaves, clean straw or hay. The following spring as soon as growth starts these young perennials can be transplanted to their permanent locations where most of them should bloom that season.

The highly hybridized perennials such as phlox, iris, and some of the delphiniums, will not come true from seed. If a start is desired in these hybridized sorts, one had better purchase rooted plants and then increase them later by division or cuttings.

Where winters are severe, as in South Dakota, it is most practical to treat many of our perennials as biennials. By this we mean to sow the seed every summer in seedbeds (as described above) to produce plants that will bloom the following year when transplanted to the perennial garden or border. The plants are wintered in the seed bed but no attempt is made to carry the plants in the garden over into the third year. Such flowers as Iceland poppy, canterbury-bells, sweet william, Chinese pink, English daisy, sweet rocket and others are best handled this way under South Dakota conditions.

**Annual Flowers.**—All annual flowers are propagated by seed. Many amateur flower growers have had good success by saving their own annual flower seed from year to year. We believe, however, that seed purchased from good reliable seedsmen will bring the best results in the long run.

Those annuals whose seeds germinate rapidly such as zinnia, calendula, marigold, sweet alyssum, bachelor button, and others can be sown in open ground in their permanent location in the spring. Annuals that require an unusually long period before blooming such as the aster must be started inside in seed boxes or flats in order to allow them time to mature and bloom before frost in the fall. Annuals whose seeds germinate slowly such as snapdragon, verbena, phlox, lobelia, balsam, petunia, and others can be started inside in flats in March or April and then transplanted to their outside location when danger of killing frosts is over. By using this practice, an earlier and longer period of bloom is secured. Annuals whose seeds can withstand moisture and freezing such as bachelor button, snapdragon, larkspur, california poppy and many others may be planted in the fall in their permanent locations and will thereby give much earlier blooms the following spring.

For starting annuals from seed indoors the type of soil used in the seed boxes should be carefully considered. A soil mixture consisting of three parts of garden loam, one part sand, and one part well rotted barnyard manure should give good results. The soil in the boxes should

not be less than two inches deep. After filling the box, settle by jarring, then press the soil down solidly with the fingers all around the edges. This is to prevent the soil from pulling away from the sides of the box later. All small seeds must be sown shallow. A good practice is to sow the seeds on the surface, cover by scattering soil on them through a fine sieve and then press down lightly with a flat block of wood or similar object. In watering flats, there is danger of washing the small seeds out. This can be avoided by placing a piece of cheese cloth directly on the soil and watering through it. It is a serious mistake to set flats of ungerminated seed in a south or west window in strong sunlight. Flats should be kept in subdued light until the plants are up. After the seeds are planted, the moisture content of the soil in the flat can be kept more uniform if wet newspapers are placed directly on the soil. These should be removed as soon as the plants appear at the surface. Glass placed over flats will conserve moisture and at the same time the grower can see when the plants come up (See Fig. 2). After the plants are up, they can be placed in direct sunlight.

At times serious trouble is encountered by a fungus disease which often kills all of the young seedlings in a flat in a very short time. This is commonly known as "damping-off" disease. This trouble can be completely eliminated if the soil is disinfected before it is placed in the flats. This can be easily done by mixing a small amount of any of the common mercury seed treating dusts such as Semesan or Us-pulin with the soil and covering tightly for a day or so. This soil should be thoroughly aired for at least a day before seeds are planted in it.

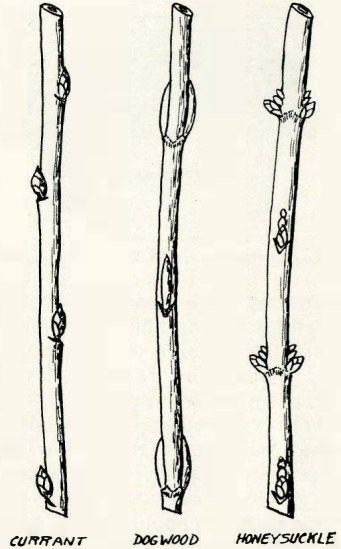


Fig. 3.—Hardwood cuttings

### Propagation by Cuttings

**Trees.**—Poplars and willows can be readily grown from cuttings. Use dormant wood of last season's growth. Make cuttings 6 to 10 inches long and plant in the spring leaving the top bud above the ground. The Russian olive can be rooted from cuttings but this is not recommended for the amateur.

**Shrubs.**—Most of our common shrubs can be propagated from cuttings. Some root best from hardwood cuttings, others respond to the softwood cutting, while some can be propagated by both methods. By consulting the table at the back of this circular, the reader can quickly find the best method to use for our common shrubs.

For hardwood cuttings, one-year-old wood is used. This should be gathered in late fall or early winter. It should be stored over winter in moist sand or soil in a cool frost-proof cellar. The cuttings should be cut in pieces eight inches to a foot in length. The top cut is made from one

to two inches above a bud to facilitate handling without injury to the bud. The bottom cut should be made just below a bud (see Fig. 3) as this effects early callusing. In the spring these cuttings are planted solidly in the soil, leaving the top bud above ground. The success of hardwood cuttings in propagating shrubs depends upon proper storage of the wood and moisture available after planting out in the spring. At best the amateur can expect only a part of the cuttings to strike root, therefore the number of cuttings made should be three or four times the number of new shrubs desired.

Softwood cuttings made from half-ripened wood can be used to propagate such shrubs as snowball, elder, hydrangea, dogwood, false-spirea, coralberry, juneberry, and others. Generally speaking, softwood cuttings are more reliable for the amateur than those made from hardwood. Softwood cuttings are taken from the shrubs in the summer during the height of the growing season. Only the tips (3 to 8 inches in length) of the growing shoots are used (See Fig. 4).

One of the best media for rooting softwood cuttings is sharp coarse sand. About half of the leaves should be removed from the lower end and the cutting then planted firmly in the sand to a depth equal to about one-half its length.

To prevent wilting, softwood cuttings should be rooted in partial shade. It is usually necessary to place under glass to prevent evaporation of moisture from the succulent leaves and stem. For home propagation, ordinary fruit jars can be inverted over these planted cuttings and pressed slightly into the soil. Leave the jars on the cuttings at all times until roots are formed, then gradually give them air.

Those shrubs which sucker freely such as juneberry, buffaloberry, false-spirea, coralberry, snowberry, and flowering currant can be readily propagated by root cuttings. This is accomplished by cutting the larger roots into pieces and planting. A large percentage of these will form plants.

**Perennial Flowers.**—The propagation of perennial flowers by cuttings is little used by the average amateur; however, it has its place in home flower growing. Such highly hybridized perennials as phlox and many of the delphiniums will not come true from seed. Where it is desired to increase rapidly an unusually fine specimen of such a variety, softwood cuttings may be resorted to rather than the slower but safer method of crown division. Such softwood cuttings should be taken early in the spring when the young shoots are about three inches above ground. In taking such cuttings, it is well to dig down into the soil in order to take the underground part of the shoot as well as that which is above the surface. Cuttings taken with a foot at the base consisting of a small part of the old original crown of the plant will root more readily. These should be planted in semi-shade and covered with an inverted fruit jar.

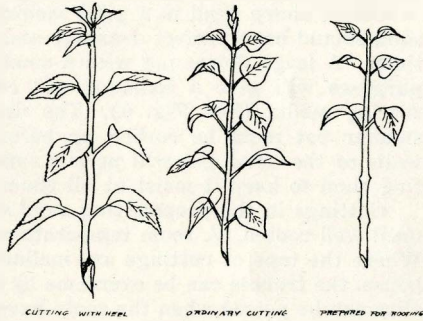


Fig. 4.—Softwood cuttings

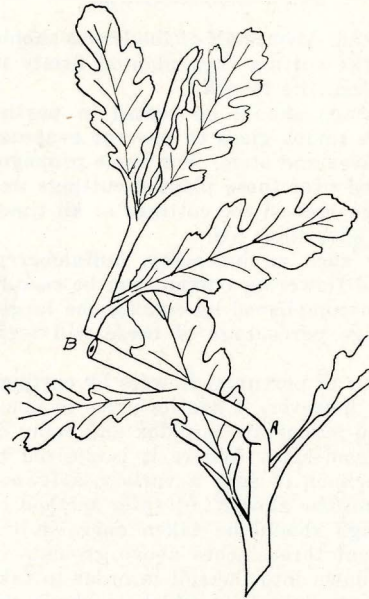


As soon as such cuttings have struck a substantial root they can be transplanted to their permanent location. Plants produced by this process will always stay true to the mother plant.

**House Plants.**—Such house plants as geraniums, begonias, coleus, and primroses can be readily propagated at home by cuttings. In making cuttings from house plants only the upper three or four inches of healthy tips should be used. The tissue of the stem should be soft and brittle and not stringy (See Fig. 5). The shoot should be removed from the plant by cutting just below a node or eye on the stem. The lower leaves should be removed to prevent wilting in dry air.

Clean, sharp sand is a good medium for rooting such cuttings. This sand should have perfect drainage and the proper amount of water at all times. A large flower pot with a smaller one in the center for irrigation purposes will give a constant and correct amount of moisture to the rooting media (See Fig. 6). The drainage hole in the bottom of the smaller pot must be corked up before filling with water. The porous walls of the inner pot will permit sufficient water to reach the propagating sand to keep it moist at all times.

Cuttings in the propagating sand should be kept from direct sunlight until well rooted. A room temperature of from 65 to 70 degrees is ideal. Where the tops of cuttings are inclined to wilt because of dry air in the house, the trouble can be overcome by inverting fruit jars over them. The slips can be potted when the roots have reached a length of one-half inch.



A - TOO OLD  
B - JUST RIGHT

Fig. 5.—Softwood cutting for perennial flowers

### Propagation by Layering

**Trees.**—It is not practical to propagate trees by layering although the caragana can be successfully rooted by this method.

**Shrubs.**—Many of our common ornamental shrubs can be successfully propagated by common or mound layering (See Fig. 1). In common layering, bend a branch of the shrub down to the ground and cover it with soil. If a cut is made through the bark near a bud on the upper side of that part of the branch that is buried, it will root more readily. As soon as a strong root is formed, the buried branch can be cut from the mother plant.

Mound layering is accomplished by throwing earth into the crown of a shrub until the lower part of all branches is covered about four inches deep. If the mound is artificially watered through one growing season, many of the branches will form roots and can be removed from the mother plant the following season.

**Vines.**—Our common ornamental

perennial vines such as Engelmann creeper, Virginia creeper, grapes, etc., are easily propagated at home by layering. In this case it is suggested that the continuous or serpentine system of layering be used (See Fig. 1).

### Propagation by Division

**Shrubs.**—Practically all varieties of shrubs having their crown at or below the surface of the soil can be propagated at home by division. This is done by digging up the shrub to be multiplied, splitting up the crown so that each has a good root and top and then replanting. In this case it is well to prune back the tops of the divided plant as soon as they are planted to prevent wilting.

**Perennial Flowers.**—Most perennial flowers are easily and safely propagated by crown division. This is not only a means of multiplying perennials at home but a means of keeping perennials in a vigorous and healthy condition. Most perennials should be so divided every three or four years.

As a convenience to the reader the following tables are included. These tables show the best and safest methods of propagating the more common ornamentals at home.

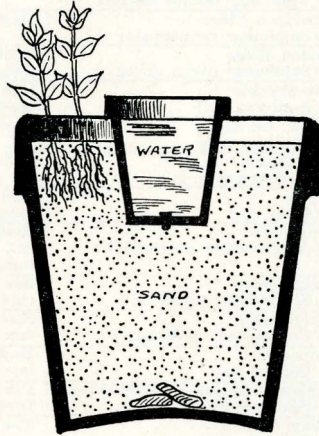


Fig. 6  
Homemade pot for rooting cuttings

### Trees

Kind	Best Method of Propagation
American Elm ( <i>Ulmus americana</i> )	Seeds sown in spring as soon as ripe.
Chinese Elm ( <i>Ulmus pumila</i> )	Seeds sown in spring as soon as ripe.
Green Ash ( <i>Fraxinus lanceolata</i> )	Seeds stratified over winter and sown in spring.
Hackberry ( <i>Celtis occidentalis</i> )	Seeds sown as soon as ripe.
Soft Maple ( <i>Acer dasycarpum</i> )	Seeds sown as soon as ripe or stratified and sown following spring.
Box Elder ( <i>Acer negundo</i> )	Seeds sown as soon as ripe or stratified and sown following spring.
Poplars ( <i>Populus</i> sp.)	Hardwood cuttings taken when dormant.
Cottonwood ( <i>Populus monilifera</i> )	Hardwood cuttings taken when dormant.
Willows ( <i>Salix</i> sp.)	Hardwood cuttings taken when dormant.
Black Walnut ( <i>Juglans nigra</i> )	Plant nuts four to six inches deep in the fall.
Caragana ( <i>Caragana arborescens</i> )	Sow seed as soon as ripe. Plants may come up before winter but they will not winter-kill. Root cuttings and layering are successful.
Russian Olive ( <i>Elaeagnus angustifolia</i> )	Sow seed in the fall. About 70 per cent will come up the following spring and the rest the following year. Cutting can be rooted under favorable conditions.
Evergreens	Home propagation usually unsuccessful.

## Shrubs

Kind	Best Method of Propagation
American Cranberrybush ( <i>Viburnum americanum</i> )	Sow seed in late summer as soon as ripe. Hardwood cuttings successful.
Nannyberry ( <i>Viburnum lentago</i> )	Sow seed in late summer as soon as ripe. Hardwood cuttings successful.
Snowball ( <i>Viburnum opulus sterile</i> )	Softwood cuttings and layering are successful.
American Elder ( <i>Sambucus canadensis</i> )	Hardwood cuttings, root cuttings and division.
Golden Elder ( <i>Sambucus nigra aurea</i> )	Softwood cuttings in early spring; root cuttings and division of crown.
Honeysuckle ( <i>Lonicera</i> sp.)	Hardwood cuttings root very easily. Remove pulp from seed, stratify and sow in the spring.
Lilacs, all kinds ( <i>Syringa</i> sp.)	Layers root easily. Division of the crown very successful.
Hydrangea ( <i>Hydrangea</i> p. g.)	Softwood cuttings and layers root easily.
Sumac ( <i>Rhus</i> sp.)	Layers, crown division and root cuttings successful. Sow seeds as soon as ripe.
Juneberry ( <i>Amelanchier alnifolia</i> )	Root cuttings, layers, and crown division very successful. Gather seeds as soon as ripe, remove pulp and sow immediately.
Buffaloberry ( <i>Shepherdia argentea</i> )	Sow seeds as soon as ripe or stratify until spring. Root cuttings and crown division successful.
Cotoneaster ( <i>Cotoneaster acutifolia</i> )	Seeds take two years to germinate: Layers successful when put down in the fall.
Dogwood ( <i>Cornus</i> sp.)	Hardwood cuttings, softwood cuttings in summer and layering are all successful.
Vanhoutte Spirea or Bridalwreath ( <i>Spiraea vanhouttei</i> )	Plant dormant hardwood cuttings early in the spring. Division of crown easy; layering moderately successful.
Dwarf Spireas ( <i>Spiraea</i> sp.)	The crowns of all divide easily. Layering moderately successful. In <i>S. bumalda</i> and <i>S. Anthony Waterer</i> softwood cuttings are successful.
False-spirea ( <i>Sorbaria sorbifolia</i> )	Hard- and softwood cuttings root easily. Root-cutting, layering, and division very successful.
Japanese Barberry ( <i>Berberis thunbergii</i> )	Clean pulp from the seeds and sow in the fall or stratify until spring before sowing. In most specimens, the crown can be divided.
Coralberry ( <i>Symphoricarpos vulgaris</i> )	Hard- and softwood cuttings root easily. Division and root cutting very successful.
Common Snowberry ( <i>Symphoricarpos racemosus</i> )	Hard- and softwood cuttings root easily. Division and root cuttings very successful.
Flowering Currants ( <i>Ribes</i> sp.)	Hardwood cuttings root easily. Division and root cuttings also successful.

## Hardy Perennials and Biennials

Name	How to Get Started	How to Increase at Home
Columbine ( <i>Aquilegia</i> )	Sow in summer for bloom the following year.	Division of clumps in spring or fall.
Hardy Asters	Sow seed or buy plants.	Division of clumps in spring or fall.
Painted Daisy ( <i>Chrysanthemum</i> )	Sow seed or buy plants.	Division of clumps very easy.
Shasta Daisy ( <i>Chrysanthemum maximum</i> )	Sow seed or buy plants.	Readily increased by dividing the clumps.
Larkspur ( <i>Delphinium</i> )	Sow seed in summer for bloom the following year. Highly hybridized sorts should be started with plants.	Sow seed from unhybridized sorts. Hybridized sorts will not come true from seeds so must be increased by dividing or by cuttings.
Pink ( <i>Dianthus</i> )	Sow seed or buy plants.	Division of clumps very easy.
Iris	Start with plants; will not come true from seed.	The enlarged roots divide very easily.

### Hardy Perennials and Biennials (Cont'd)

Name	How to Get Started	How to Increase at Home
Oriental Poppy ( <i>Papaver orientale</i> )	Set young plants in the fall.	Divide roots in early fall.
Iceland Poppy ( <i>Papaver nudicaule</i> )	Sow seed in summer for bloom the following year. Cannot be transplanted easily.	Treat as a biennial. Sow seed each summer for bloom following year.
Peony ( <i>Paeonia sp.</i> )	Set plants in the fall.	Divide roots and transplant in the fall.
Phlox	Start by buying plants as hybridized sorts do not come true from seed.	Divide clumps in the spring. Cuttings from young shoots in spring.
Canterbury Bell ( <i>Campanula</i> )	Seed in summer for bloom following year.	Treat as a biennial. Sow seed each summer for bloom following year.
Daylily ( <i>Hemerocallis sp.</i> )	Best to start with plants as it is too slow from seed.	Divide clumps every three or four years.
Sedum	Best to start with plants.	Easily propagated by division or runners.
Pyrethrum ( <i>Chrysanthemum coccineum</i> )	Sow seed in summer for bloom the following year.	Divide clumps and transplant every third year.
Sweet William ( <i>Dianthus barbatus</i> )	Sow seed in summer for bloom the following year.	Treat as a biennial. Sow seed each summer for bloom following year.
Chinese Pink ( <i>Dianthus</i> )	Sow seed in summer for bloom the following year.	Treat as a biennial. Sow seed each summer for bloom following year.
Goldenglow ( <i>Rudbeckia</i> )	Best to start with rooted plants.	Divide clumps or make root cuttings from young shoots in spring.
Goldentuft or Basket-of-gold ( <i>Alyssum saxatile</i> )	Sow seed in summer for bloom the following year.	Remove and transplant rooted runners.
English Daisy ( <i>Bellis</i> )	Sow seed in summer for bloom the following year.	Treat as biennial. Sow seed each summer for bloom following year.
Sweet rocket ( <i>Hesperis</i> )	Sow seed in summer for bloom the following year.	Treat as a biennial. Sow seed each summer for bloom following year. Easily reseeds itself.
Babysbreath ( <i>Gypsophila</i> )	Sow seed or buy plants.	Divide clumps and transplant every third year.
Gaillardia	Sow seed in summer for bloom the following year.	Clumps can be easily divided and reset in the spring.
Hollyhocks ( <i>Althaea</i> )	Sow seed in summer for bloom the following year.	Is a biennial. Reseeds itself very easily.
Gladiolus	Buy bulbs, plant in spring for late summer bloom.	Dig bulbs in fall and store in dry frost proof place. Divide bulbs and plant the following spring.
Dahlias	Buy roots and plant in late spring for late summer bloom.	Dig roots in fall and store in frost proof place. Divide roots and plant out again the following spring after frost danger is past.

**Extension Service**  
**South Dakota State College of Agriculture and Mechanic Arts**  
**Brookings, S. D.**

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