

EXTENSION BULLETIN 425

Home and Family Series

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# BEAUTIFUL HOME GROUNDS

Through SIMPLIFIED METHODS

By Staff Members in Horticulture, Botany, and Entomology



Cooperative Extension Service MICHIGAN STATE UNIVERSITY

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# Suit your way of life

*This publication is written to suit the needs of urban and suburban residents. It sets forth simple procedures for maintaining home grounds with a minimum of time and effort.*

## Feature what you prefer

You may be a barbecue family and require a large area of pavement or patio stones.

You may be a plant enthusiast who gets pleasure from flowers, trees, shrubs, green lawns, and fine roses.

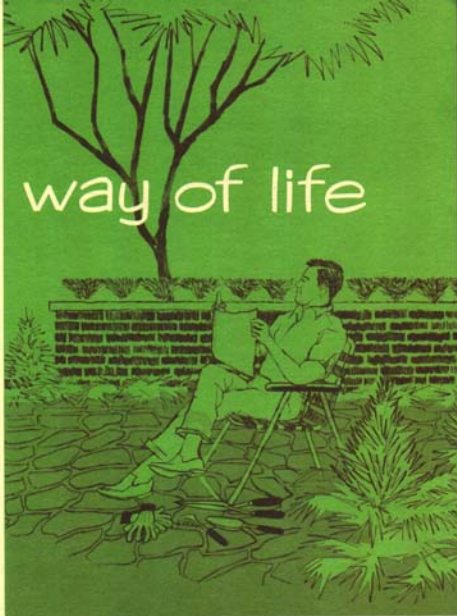
Whatever your interests, develop your garden to your individual tastes. Once a landscape has ceased to perform its function, don't be afraid to modify it with something you like.

## Select your plants carefully

Use plants that you like the best, but select the kinds that are suited to your climate. Don't try to grow azaleas and dogwoods where lilacs and crab apples will perform more beautifully and with much less attention. Select plants that have more than one attribute; for example, use asparagus for a fresh vegetable, but plant it where it will form a hedge in the summer; have gladiolus or zinnias in front of it. Use strawberries for a ground cover and at the same time enjoy their fruit. A 'Dorothea' crab apple has good shape all year around, beautiful flowers in the spring, and good colored fruit in the fall. Plant low growing evergreens to reduce the amount of pruning.

## Make it easy on yourself

By having wider driveways and sidewalks for convenience of the traffic, larger patio areas, or paved spaces for children, wider border plantings and more trees and shrubs, you can reduce your lawn area



substantially and consequently reduce the cost of maintenance.

The use of more perennials in borders, more areas of ground covers combined with flowering bulbs will reduce work.

Have only a few areas that are planted annually or places where you can fuss with the garden. Locate them strategically so they will be conspicuous from the street or from one of the most popularly used windows in the house.

By concentrating your efforts in these areas and using lights on them at night, you can obtain maximum enjoyment with minimum maintenance.

## Enjoy yourself

Above all, enjoy the time you spend in your garden. Your time is precious; so don't turn pleasures into pressures. If properly handled, gardening can be preventive medicine because plants are for people to enjoy. If you are fond of sweet corn, grow some. Just see how excited you will get the day it is ready to pick. You will see also that when plants are skillfully maneuvered, they can take complete command of your physical and mental power.

NEW HOME BUILDERS often bury or dispose of existing top soil—the top 2-10 inches of loam containing organic matter resulting from decaying plant materials. Sub soil is soil that originally was beneath the top soil. It may be heavy, contain a lot of clay or sharp sand and may contain shale or other rocks.

Too often poor subsoil is all that is left on top of the home grounds, especially close to the foundation. When this happens, it is most important to buy enough of the best top soil to make a cover at least 4 inches deep over your property. This layer forms a base for the lawn or garden.

Unless there is a minimum of four inches of good organic top soil, compaction over the years, too much or too little water absorption, and difficulty in cultivation, will cause all types of unforeseen trouble.

### Improve existing soil

Loamy soil, with a clay, silt and sand mixture, is ideal for most garden plants. Heavy clay soil can be improved by the addition of peat moss, well rotted manure, decayed leaves, or other organic matter. Sandy soil can be improved in the same way. When soil is extremely heavy and sticky, an inch or more of coarse sand plus several inches of well decayed organic matter should be spaded or roto-tilled into it. If it is possible, all garden soil planted annually should be turned over to a depth of at least 6 inches every spring. The only way to avoid this process is to use a mulch.

### Mulches

Mulching can be done with well decayed manure, peat moss, ground corn cobs, leaf mold, peanut hulls, straw, sawdust shavings, shredded bark, grass clippings, and other materials. Mulching merely means that a sufficiently heavy layer of this material is placed over the soil and around the plants so that the weeds will not be able to grow through it, so that it holds the moisture in the soil and keeps the soil cooler in summer and warmer in winter. The process of mulching can save a great deal of time and work in the garden. It is highly recommended.

### The compost pile

The compost pile is a convenient place to dispose of crop residue during the season and at the same time produce your own supply of organic matter for next year's crop. Organic matter is valuable and if well prepared is as good as manure that is purchased at great expense.

If your soil is well drained, build an 18 inch deep pit in a shady corner of your garden behind some trees or shrubs. Make a frame out of rough lumber for this pit.

If the soil is not well drained, make your pit on the surface. An area 6 feet by 6 feet and 18 inches deep should be adequate for most gardens.

If you dig a pit, save the soil so that you can use it later. Place the stalks, stems, roots of all plant material that is not woody into this enclosure. Include all of your weeds, lawn clippings, leaves from trees and shrubs. Even table scraps are satisfactory unless they contain grease or meat.

After you have a layer that is 6 or 8 inches deep, add a little soil from the excavation to weight it down and hold the moisture in place. It may be necessary to water the compost pile from time to time and then make alternate layers of refuse and soil as it becomes available until you have reached the top of the pit. Spread 3 cupfuls of 10-10-10 fertilizer on top of each layer of soil as you place it in the compost pile and leave the whole thing for at least a year before it is removed.

You will find that this decayed organic matter makes a good mulch, makes a good addition when you are planting trees or shrubs, a good top dressing for your lawn and at the same time is providing you with an opportunity to save all of your refuse.

# About soils and fertilizers

## Just what is fertilizer?

Fertilizer is a combination of chemicals that is prepared to help restore fertility to an otherwise starved soil. It will make the plants greener, more vigorous and more productive.

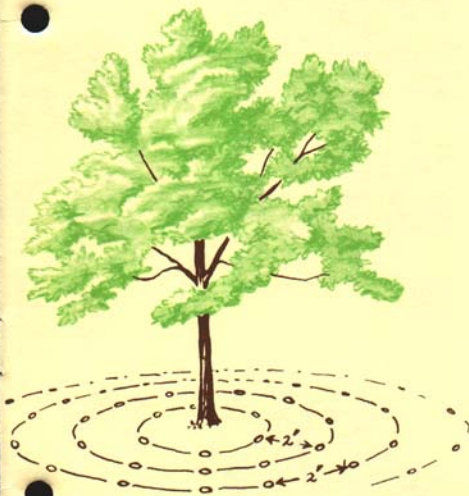
Analyzing exactly what the soil already has in it, what the plant requires and applying the right amount of the right fertilizer is a highly technical matter.

If a soil test is desired, a representative sample should be submitted to a professional soil testing laboratory. There an analysis will be made and a fertilizer recommendation suggested based upon the results of the test, the plants to be grown, and past cultural practices. Call your county agricultural extension office about soil testing.

In general, plants need nitrogen, phosphorus, potash and calcium in large quantities, as well as some other elements in very small amounts.

## Fertilize trees and shrubs

Trees and shrubs should be fertilized early in the spring before growth begins or in late October or November.



*Pattern of holes for fertilizer application to shade trees.*

Avoid late spring and summer applications of fertilizer. When your trees are growing slowly and do not have a healthy, vigorous foliage, it is likely that they need an application of fertilizer. If you use 10-10-10 on your lawn, for instance, put 2 or 3 handfuls around each shrub at each application. When trees are growing in the lawn, additional fertilizer needs to be supplied to their roots, at least every other year. On trees where the trunk is less than 6 inches in diameter four feet above the ground, use one pound of well balanced fertilizer for every inch of diameter of the trunk. If the trees are older, and the trunk is more than 6 inches in diameter four feet above the ground, add 3 pounds for every inch of diameter of the trunk.

Before applying the fertilizer, soak the soil thoroughly by leaving the lawn sprinkler under the tree for 2 hours. Make an imaginary circle under the tree 2 feet from the trunk, another circle 2 feet from the first circle until you have a series of circles that extend just beyond the spread of the branches of the tree. Then with a heavy punch bar make holes 2 feet apart in each of these circles. The holes should be 18 inches deep and 1½ inches in diameter. Pour about a half of a small-sized frozen-fruit-juice can of fertilizer in each hole that you have made. Divide the fertilizer evenly among the holes and let the sprinkler run for another hour. Refill holes with a mixture of sand and peat.

A specially designed hollow rod that saves using a punch bar is available. It can be attached to the end of the hose so that the water will automatically dissolve cartridges of fertilizer.

If part of the surface of the soil under the tree is covered with a sidewalk, the amount of fertilizer should be reduced accordingly. If the tree is not located in the lawn area, fertilizing can be done by applying a 6 inch depth of well rotted manure.

Regardless of the size of your tree, you should continue to water it thoroughly during dry periods in the summer and fall. To do this conveniently, adjust the sprinkler so that it will cover the area under all of the branches of the tree and let it run for 2 hours or more, as is necessary to wet the soil mass thoroughly.

## Fertilize Flowers

For annuals or perennials in the flower garden, well rotted manure is excellent. The number of weeds that germinate from the manure can be reduced by putting a mulch over the manure. If manure is not available, spread 2 pounds of garden fertilizer (for example, 5-10-10) for every 100 square feet of area. Smaller applications every 6 weeks during the growing season will also help your garden flowers.



# Trees are a must

BY CLARENCE E. LEWIS  
*Department of Horticulture*

Good trees generally grow slowly, which means they should be the first plants to be placed on the property. Trees are the basis of good design, and so their location has more influence than any other plant.

Trees are useful by providing (1) maturity to a planting, (2) shade during the summer, (3) protection from winter winds, (4) less noise from nearby street traffic, (5) screening from the outside, (6) elimination of undesirable vistas and, (7) a sense of security and comfort.

Since trees grow slowly you can purchase a tree that is already partly grown. Most large trees should be planted at least 40 feet from the house, depending on the shape of the tree. Narrow headed, oval or columnar trees can be placed much closer while those with pronounced spreading branches may need even a greater distance. Medium trees should be at least 30 feet apart and small trees 15 to 20 feet. (This again, depends upon the shape.)

## Some trees are less desirable

Trees may be subject to storm damage because of weak or brittle stems and crotches. When broken they can be a source of great expense. Other trees, like Norway Maple, have very shallow roots and plug





sewers and water lines. Some have far-reaching roots, like willows, and can plug sewer and water lines or damage sidewalks, driveways and pools.

It may not be the fault of the tree that it dies. Top soil added to the existing ground level under a tree will in time cause this tree to deteriorate and die. Some species may live longer than others but none exist under these conditions—the heavier the application of soil the quicker the tree dies.

Occasionally a tree may be classed as undesirable but if it is the only shade tree on a back lawn, it can be kept and nourished.

### Narrow evergreen trees are useful

These trees show foliage throughout the year, providing screening in all seasons. Not only do they shelter the home and prevent winter temperatures from dropping too low, but they also eliminate summer traffic noise and provide summer cooling.

There are many narrow leaved evergreen trees to choose from. Check with your local nurseryman or county extension agent for the best selections. These improved trees may have richer green foliage, narrow heads, weeping habits, slower growing, etc. that may be beneficial to you and your landscape.

## Trees for special purposes

### Larger Home Grounds

Ash  
Beech  
Fir, White  
Honey Locust (thornless and fruitless)  
Linden (Little-leaf or Crimean)  
Maple, Sugar  
Maple, Norway  
Maple, Red  
Oak, Red  
Oak, English  
Spruce, Norway  
Walnut (if existing)  
White Pine  
Kentucky Coffee Tree

### Moist Locations

American Arborvitae  
American Hornbeam  
Bald Cypress  
Larch, American  
Pin Oak  
Red Maple

Sour Gum  
Sweet Gum  
Willows, many forms  
Paper and River Birch

### Small Home Grounds

Birch (Paper, Gray, River)  
Blue Spruce  
Crab Apples (flowering)  
Hawthorne  
Hop Hornbeam  
Maple, Norway and Sugar  
(narrow-headed forms)  
Maple Amur and narrow headed forms of Red Maple  
Mountain Ashes  
Russian Olive  
Smoke Tree  
Linden, Little-leaf  
Yellow Wood  
Cherries (oriental flowering)  
Hop Hornbeam

### Semi-Dry Locations

Hawthorn

Pine (Jack, Scotch or Austrian)  
Russian Olive  
Sumac

### Attract Birds

Cherries  
(Not most ornamental types)  
Hawthornes  
Crab Apples  
Junipers  
Mountain Ashes  
Juneberry  
Mulberry

### To Withstand City Conditions

Blue Spruce  
Crab Apple  
(some better than others)  
Hawthorn  
Honey Locust  
Linden, Little-leaf  
London Planetree  
Norway Spruce  
Pine, Scotch

## These are good trees

Small—15 to 20 ft., Medium—possibly 30 ft., Large—50 ft. or more

NAME AND SIZE	REASONS WHY	NAME AND SIZE	REASONS WHY
<b>ASH</b> Red Ash Medium Green Ash large	fast growing, shallow roots, yellow in fall vigorous, dense, oval shaped	<b>LOCUST</b> Honey Locust large	well shaped tree, lace-like foliage, easily grown (Use a thornless and fruitless type)
<b>BEECH</b> European Beech medium to large  American Beech large	good shape, broad spreading, good for shade, purple, weeping, upright and cut-leaf forms slow spreading, beautiful tree, good foliage, broad spreading Both need large area	<b>MAPLE</b> Amur Maple small  Sugar Maple large  Red Maple large	dense, shrub-like, multiple trunks, fruits red, fall color bright red, short lasting, slow growing, dense shade, oval form, red, yellow autumn color, subject to injury from salt, fumes, heat near road, good tree, grows in wet ground, scarlet fall color
<b>BIRCH</b> White barked Birches small to medium	paper birch, beauty of bark, for dry areas	<b>MOUNTAIN ASH</b> Mountain Ash small	good tree for home grounds, white flowers May, red fruits in late summer (August) and fall, many new selections available
<b>CHERRY</b> Fugenzon small Kwanzan small	vase habit, flowers large, light pink, double, good bronze-red fall color "v" or vase habit, early foliage red-dish, deep pink double flowers	<b>OAK</b> Shingle Oak large English Oak large Pin Oak large Red Oak large	good form, good foliage, disease resistant, leaves persist into winter broad tree, poor fall color  finely cut leaves, subject to yellowing of leaves fast-growing, good reliable tree, good in city, red fall color
<b>CRAB APPLE</b> Dorothea small  Red bud small  Scheidcker small von Eseltine	rounded habit, branches arching, double pink colored flowers annually, yellow fruit into winter rounded habit, vigorous, many white flowers, persistent red fruit  semi-upright habit, interesting branches, double pink flowers upright habit, double light-pink flowers	<b>PLANE</b> American Plane (Sycamore) large London Plane large	white bark with brown patches, fast growing  wide spreading, bark flakes leaving yellow patches, trims well, fast-growing
<b>DOGWOOD</b> Flowering small  Kousa small	good flowering tree for southern Michigan; in central or south central, plant in protected places; excellent red fall foliage and fruit. Mid-June flowering, red fall foliage, mottled bark.	<b>RUSSIAN OLIVE</b> small	sprawling habit, dull gray-green leaves, silvery yellow fruit, good in windy locations
<b>ELM</b> Little-leaf or Chinese small to medium	round headed and shaped like American elm, interesting mottled back, resists Dutch elm disease	<b>COMMON OR EUROPEAN SMOKE TREE</b> small	upright narrow, green to tan flower masses appear like smoke, orange to red autumn color
<b>HAWTHORN</b> Paul's Scarlet small Washington small	well shaped tree with showy, double scarlet flowers upright dense habit, flowers white in large clusters, leaves orange to red in fall, scarlet fruits persist into winter	<b>SOUR GUM, TUPELO</b> medium to large	pyramidal, leathery leaves, orange to scarlet autumn color, difficult to transplant
<b>HICKORY</b> Shagbark Hickory large	narrow upright form, good branching, golden brown in fall, produces good nuts, difficult to transplant, utilize if existing tree only.	<b>SWEET GUM</b> large	beautiful pyramidal tree, difficult to transplant, scarlet in fall
<b>LINDEN</b> Crimean medium Little Leaf Linden	graceful pendulous branches, bright green leaves, fragrant flowers slow growing, dense habit, pyramidal form, excellent shade, good in cities	<b>WALNUT</b> Black Walnut large	round upright stately habit, coarse foliage, nut and wood of value; slow growing, difficult to transplant



## These are poor trees

NAME AND SIZE	REASONS WHY	NAME AND SIZE	REASONS WHY
<b>APPLE</b> <i>small to large</i>	to produce edible fruit, they require regular spraying, pruning; spreads insects and diseases unless cared for	<b>MULBERRY</b> <i>medium</i>	messy fruit seeds spread plant by germinating readily; otherwise not as troublesome as some
<b>BOX ELDER</b> <i>medium</i>	rapid growing, weak tree, shallow root, short life attracts insects, prohibited in some areas	<b>POPLAR</b> Carolina Poplar <i>tall</i> Cottonwood <i>large</i>	drops catkins, roots block sewers and water lines, damages lawns, walks, driveways, prohibited in some urban and suburban areas, wide spreading, unattractive, withstands drought
<b>ELM</b> American <i>large</i> Siberian <i>medium</i>	poor because subject to Dutch elm disease  fast growing, weak wood, may be used in drought areas, resists Dutch elm disease. This often is incorrectly termed Chinese elm	<b>TREE OF HEAVEN</b> <i>medium</i>	fast growing, thrives under poor conditions, weak, wood brittle, offensive odor from flowers. Suckering growth must be controlled. "The tree that grows in Brooklyn"
<b>MAPLE</b> Silver Maple <i>large</i>	rapid growth, branches break easily, wood brittle, root damaging to gardens, sewers, sidewalks	<b>WILLOW</b> Pussy Willow <i>small</i>	large catkins, rapid growth, weak wood, unattractive unless cut to ground each year and used as a shrub, constant dropping of small branches, troublesome root system for home grounds. This is true of all willows

## These are good evergreen trees

NAME AND SIZE	REASONS WHY	NAME AND SIZE	REASONS WHY
<b>ARBORVITAE</b> American Arborvitae <i>medium</i> Siberian or Ware Arborvitae <i>medium</i>	flattened leaves, grows well in moist soil  upright broad columnar habit, good dense evergreen	<b>PINE</b> Austrian Pine <i>large</i> Jack Pine <i>medium</i> Red Pine <i>large</i> Scotch Pine <i>medium to large</i> White Pine <i>large</i>	sturdy, broad pyramidal pine, good roadside tree  irregular form, but grows well on poor sandy soils, difficult to transplant  grows rapidly, has reddish bark, use for windbreak, better in Upper Mich.  grows rapidly, has artistic form as it matures, Christmas tree  light feathery foliage, rapid growth, picturesque specimen when mature
<b>FIR</b> Douglas Fir <i>large</i> White Fir <i>medium</i>	symmetrical, stately, flat green needles, often bluish  narrow pyramidal, long flat needles that curve upward, often good blue color	<b>SPRUCE</b> Black Hills Spruce <i>large</i> Blue Spruce <i>medium</i> Colorado Spruce <i>medium</i> Norway Spruce <i>large</i>	more compact growing type of white spruce, makes good lawn specimens, for northern Mich.  Koster or Moreheim grafted selections are very blue but not as symmetrical as Colorado seedlings  typical layered appearance of evergreen, good reliable tree, intensity of blue color varies  good, rapid growing tree, good green
<b>HEMLOCK</b> Canadian <i>large</i>	graceful shape, terminal growth pendulous, fine textured foliage, needs good drainage and protection from strong winds, becomes large tree but can be severely pruned into hedge		
<b>JUNIPER</b> <i>small to medium</i>	selected forms like 'Canaert', 'Keteleer', 'Ames' and 'Mountbatten'		

WHEN A NEW SHRUB ARRIVES, it may be dry. If its roots are in a ball of soil, soak the entire ball, including the burlap or tar paper wrapping, in a tub of water for a few minutes. If the roots are bare, soak them in a pail of water for half an hour, and then plant immediately.

If a shrub arrives in a metal or other container and the soil ball is dry, water it thoroughly and store it in the container in a sheltered spot until you are ready to plant it.

### Planting

When planting any shrub, dig the hole at least twice the diameter of existing roots. After partly filling the hole with good soil, place the roots in the hole. When the roots are wrapped in decaying burlap it may be cut with a sharp knife so that some of the roots can get through the slits. If the burlap is new and firm, or the plant is in a metal container, remove this container completely just before planting. Be careful not to disturb the ball of soil. After setting the roots in the hole, fill two-thirds of the hole with soil and

# Shrubs and evergreens

pack firmly. After settling, backfill the hole with soil, arranging a saucer to serve as a water reservoir on the surface. It is well to plant a shrub at the same depth as its previous location, indicated by discoloration on stem.

## These are good flowering shrubs

### NAME AND SIZE

### REASONS WHY

#### ALPINE CURRANT

*medium*

greenish yellow, fragrant, inconspicuous flowers in April, grows in shade or sun, scarlet fruit

#### BARBERRY, JAPANESE

Mentor (hybrid)  
Pygmy  
*low*

well branched shrub, foliage green in summer, bronze in fall, hedge foundation or border, Pygmy has red summer foliage

#### BEAUTYBUSH

*large*

upright spreading, showy pink flowers, late May or early June, brown seed pods, full sun, borders, specimen

#### COTONEASTER

Creeping, spreading  
rock  
*low*

great variety of types, inconspicuous pink or white flowers, dense foliage, attractive red berries

#### FLOWERING ALMOND

*low*

round topped, popular little shrub, many double pink or white flowers in May, plant in sun

#### FORSYTHIA

Lynwood Gold,  
*medium*  
'ARNOLD DWARF'  
*low*

variety of types, early or mid-April, upright or weeping, named types have larger and darker yellow flowers

### NAME AND SIZE

### REASONS WHY

#### HONEYSUCKLE

Fragrant winter  
*medium*

small white fragrant flowers

Amur

*tall*

large white flowers in May, red berries in fall

#### HYDRANGEA

Snowhill  
*low*

large flowers, green to white to brown, everlasting, takes shade

#### FLOWERING QUINCE

*medium*

flowers reddish pink, scarlet, coral or white in May, branches used for forcing, yellow fruit

#### LILAC

*tall*

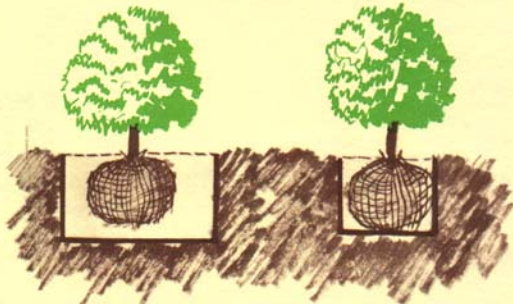
select from long list of hybrid types according to flower color, odor, double or single flowers, plant in full sun, flowers in May

#### MAGNOLIA

Saucer  
*tall*  
Star  
*medium*

large pink, white or purple flowers in May, will become a tree

fragrant white star-like flowers in April, both flower before leaves



Allow plenty of root room.

### Water well

After the soil is completely firmed around the plant, water it thoroughly using at least one pail of water for each plant.

Water thoroughly at least once a week during the growing season unless there has been an inch of normal rainfall. During dry seasons and prior to the freezing of the ground in the fall, most shrubs should receive an abundance of moisture so there will be less danger of winter injury.

### Mulching

Well rotted cow manure, decomposed sawdust, peat moss, straw, decayed leaves, or any other mulching material should be spread around the shrub soon after it is planted. A 2 or 3 inch depth of this material, spreading out as far as the branches extend, will keep the roots cooler and more moist in the summer, warmer, and more moist in the winter. It can be advantageous to keep a permanent mulch around shrubs as a natural protection.

### Fertilizer

In the spring of the year one cupful of balanced lawn fertilizer spread uniformly on the soil covering the area that is under the spread of the branches of a shrub 2 foot tall should be sufficient fertilizer for one year. This fertilizer will dissolve naturally or as a result of your watering and supply the necessary nutrients for the shrubs.

### Winter protection

Mulching and watering as described above are fundamental steps for winter protection. You can do little to overcome the low temperature. Shading the plants with burlap, evergreen branches, corn stalks or straw, fastened in place with circles of plastic

#### NAME AND SIZE

#### REASONS WHY

MULTIFLORA ROSE  
*medium*

needs much space (10 ft. width), use as hedge, fast growing, white inconspicuous flowers, red fruit attracts birds—not for small home grounds

CORNELIAN CHERRY DOGWOOD  
*large*

Early yellow flowers, red fall fruits

#### VIBURNUM

Arrow-wood

upright, useful for screens and native plantings, Red fall foliage

Carlesii

*low to medium*

round top dense shrub, fragrant, pink to white flowers in May

Wayfaring tree

*large*

Vigorous grower, red, July fruits turning black

'Mariesi' doublefile

*medium to large*

Lateral growth, flat flower clusters, May, bronze fall foliage

#### WINGED EUONYMUS

*medium to large*

Small or dwarf type, corky flanges on bark, flowers and fruits sparse, fall foliage distinctive scarlet pink, there is a good dwarf variation, 'Compacta'

covered clothesline will protect shrubs from drying winter winds.

Colorless, flexible, and long lasting protective plant sprays sold under different brand names will help reduce evaporation from the surface of the leaves or the needles during the winter. Apply these materials on a 40 to 50 degree day in December, being careful to follow the manufacturer's directions, and again during late winter (Feb. 15-Mar. 15) when the temperature is above freezing.

The weight from snow drifts, ice, or freezing rain, may break the branches of evergreens. On spreading, bushy plants, a wrapping of fishnet will reduce this injury. A support made with stakes driven into the ground around the plant, interlaced with heavy cord, will prevent upright types from bending and pulling apart.

### Protection from mice and rabbits

A cylinder of metal screening, 4 or 5 wires to the inch, fastened around the trunk of shrubs and trees is probably the best protection from rodents. Be sure that the cylinder is far enough into the soil that the mice can't get under it, yet high enough so that it will extend above the level of the snow.

If you are plagued with mice, use a poison bait that is available in most garden and hardware stores. Place it directly in the runways, on the surface, or under the ground. Bait stations prepared by placing the bait in crushed tin cans prevent animals and birds from consuming it.

A mixture of 1½ pounds of rosin dissolved in one quart of denatured commercial alcohol is a good



Arrange soil to provide reservoir for water.

repellent for rabbits. It should be painted on the bark from the soil level up to above the snow level on a dry warm day in November.

### Select those you prefer

While there are literally hundreds of flowering shrubs—those that lose their leaves in the fall and those that hold their leaves all winter—the following lists have been prepared to cover some of the most

## These are good evergreen shrubs

### NAME AND SIZE

### REASONS WHY

#### ANGLO-JAPANESE YEW

(Brown, Hicks)  
tall

upright types with individual variations, good dark green leaves, will stand shearing, many other good selections are available

#### LOW JUNIPERS

Andorra, Sargent,  
Japanese Garden,  
Blue Rug, etc.

low spreading, take full sun

#### HETZ JUNIPER

medium

wide, upright branching, aqua colored

#### JAPANESE HOLLY

medium

makes a 5-ft dense shrub, good for shady location. Many good varieties from dwarf to medium, variable leaf sizes and shapes, use only in protected locations in Southern Mich.

### NAME AND SIZE

### REASONS WHY

#### JAPANESE YEW

(capitata)  
medium to large

upright spreading forms, will spread to 7 feet in width, good rich dark green leaves, many variations in shapes and sizes, may reach 15 ft., possibly more, often tree-like

#### MUGO PINE

medium

broad round shrub, mound-like dwarf forms available

#### PFITZER JUNIPER

medium

gray-green color, semi-spreading branches at all angles, easily grown, 'Compacta' good dwarf variety, a very reliable large spreader

#### PYRACANTHA

medium

often called firethorn, a rapid growing, dense shrub with dark green leaves, bright orange red berries in fall and winter, leaves burn brown in winter

popular and most satisfactory in this climate. There is a great variety of the types of some of these plants, so when you select them, give particular attention to the new introductions, and special forms.

While shrubs vary in height depending upon their

age and the vigor with which they are growing, it might be generally assumed that when mature, low ones are less than 3 feet in height, medium shrubs are less than 8 feet in height, and large ones are less than 20 feet in height.

## How to diagnose problems of evergreens

### INJURY

### CAUSES

#### YOUNG PLANTS

Seeds fail to germinate.

Lack of moisture, collar rot.

Cuttings or seedlings wilt or die.

Damping off, lack of moisture in air or soil, temperature too high, insect injury.

#### ROOTS

Root injury.

Lack of moisture, mechanical injury from cultivating or transplanting, freezing, too much moisture, nematodes or insects.

#### TRUNK or BRANCHES

Pitch on stem below soil line.

Pine root weevil.

Bark injury.

Mechanical, sunscald, bark beetle.

Dying of lower branches.

Lack of moisture or sunlight, spruce canker.

Swelling on stems.

Spruce gall aphid.

Orange pustules on bark.

Blister rust, other rust.

White cottony masses or foamy matter on trunk and limbs.

Bark louse aphid, mealy bug, spittle insects.

Tunnels in trunk or branches.

Borers.

Terminal leader girdled, wilting new branches, distortion of branches ruin shape of tree.

Mechanical injury, European pine shoot moth, tip moth, pine weevil.

Twisting of new growth.

Herbicides.

#### NEEDLES

Wilting, ragged areas and tunnels on young needles and flower buds.

Frost, lack of moisture, gall mite, black vine weevil, saw fly, leaf-miner.

Discoloration, drying, browning.

Frost, lack of moisture, too much fertilizer, drying wind, sunscald, air pollution, cedar blight, leaf blight.

Needles fall.

Natural every year, lack of moisture.

Lifeless gray tinge to foliage.

Red spider (hand lens).

Needles become yellowish green.

Lack of moisture and fertilizer, nematodes on roots, grubs in soil, herbicides.

Hard green galls or long yellow tongue-like growth in warm, rainy weather.

Cedar apple rust.

# How to diagnose problems of trees and shrubs

BY C. E. LEWIS, *Horticulture*

## INJURY

## CAUSES

### WHOLE PLANT

Plant makes poor growth first or second year after planting.

Pot bound if container grown. Insufficient root system to supply shrub. Planted too deep or too shallow. Poor drainage. Dried-out. Root competition from nearby trees.  
2,4-D injury.

Twisting young stems.

### TRUNK or BRANCHES

Gray or brown shell-like areas.  
Partial die-back.

Scald.  
Winter injury, borer, basal mechanical injury, fungus.  
Bacterial blight.  
Nematodes.  
Galls.

Young stems with dark stripes.  
Swelling of stems, irregular branching.  
Round abnormal growths (usually at node).

### LEAVES

Curled and distorted.  
Brown irregular areas.  
Lines or tunnels.  
White or powdery appearance.  
Grayish or yellowish fine specks, sometimes accompanied with web.  
Leaves gray, then become black.  
Poor green or yellowish green.  
Wilting of young growth, eventual death of plant.  
Brown to black circular spots.  
Chewed leaf margins.  
Greenish young insects crowded near tips of stems and under leaves.  
Leaves skeletonized.  
Leaves rolled.

Aphids, 2,4-D injury.  
Spray injury, fungus.  
Leaf miner.  
Powdery mildew.  
Spider mite.

Bacterial blight, dog urine.  
Mineral deficiency, excessive soil salts.  
Gas leak, lack of water, poor drainage, anthracnose.  
Fungus or bacteria.  
Taxus vine weevil.  
Aphids.

Webworm.  
Leaf roller, dry weather, extreme cold.

### FLOWERS

Shrub never flowers.

Too much shade, flower buds frozen, excessive vegetative growth, seedlings take longer to flower.

Flowers only partially develop, some turn brown.  
Short flowering period.

### Frost.

Temperatures unusually high, extreme dryness, borer.

Flowers suppressed.  
Weak color.

Nematodes, too much shade.  
Nutrient deficiency.

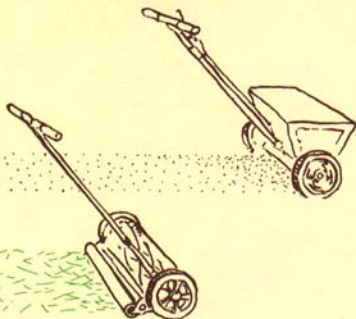
### FRUIT

No fruit.

Male or female plant, poor pollinating, spring freeze, too much shade, insufficient light.

Few fruit.

Poor pollination, excessive vegetative growth.



# Lawn care

BY HAROLD DAVIDSON  
*Department of Horticulture*

A beautiful, green, weedfree lawn can be yours with a minimum of effort if you follow a few simple practices. Early in the spring as soon as the weather is pleasant, rake the lawn to remove sticks, stones, leaves and other debris that have accumulated during the winter. If the grass was cut short last fall and much of the debris has blown away, you can omit the raking.

## Rolling

Unless there has been severe heaving of the soil or the surface is bumpy, it is rarely helpful to roll the lawn.

## Thatch removal

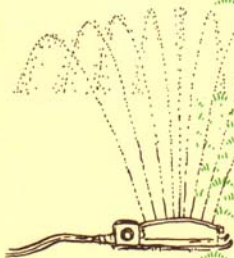
Many fine lawns will produce a heavy organic layer between the soil and the grass surface; this is known as thatch. It should be removed periodically to improve water penetration and reduce the possibility of a disease infestation.

Thatch may be removed with the aid of a machine that has been designed for this purpose. The machine may be rented at most lawnmower service centers.

For additional information, see Michigan State University Extension Bulletin E-646 available from your County Agricultural Extension Agent's office.

## Fertilizer programs

All lawns need fertilizer. If you don't believe that your lawn needs fertilizer, spread some on a small



patch and wait to see the results. In selecting your fertilizer choose one of the following three programs:

(A) Bags or boxes of fertilizer labeled "lawn food" should be used exactly as recommended by the manufacturer. Often these formulations are combinations designated as 12-6-6, 10-6-4, etc., and may be bought as such, especially if used in large quantities. Ordinarily it takes about 10 pounds of this type of fertilizer on 1,000 square feet of Kentucky Bluegrass and about 20 pounds per 1,000 square feet of Merion Bluegrass turf. This fertilizer should be applied early in the spring and repeated three or four times during the

year for a rich green turf. Water thoroughly after each application.

(B) If you have used a complete lawn food as recommended under (A) for the last 3 to 5 years, your lawn probably only needs an application of nitrogen. One pound of nitrogen per 1,000 square feet applied before the grass turns green (around April 1) and the same amount applied early in July and early in September (4th of July and Labor Day) should be sufficient to keep the lawn green throughout the whole season.

## How to diagnose problems on lawns

PROBLEMS	CAUSES	PROBLEMS	CAUSES
<b>NEW LAWNS:</b>			
Seed doesn't come up.	Lack of moisture, old seed, too cold, sown too deep.	Green circular spots—(may turn brown).	Dog urine.
Lawn is spotty.	Lack of moisture, washing, variable soil types or soil depths, variable nutrition, especially lack of nitrogen.	Mushroom, toadstools or fairy rings in the lawn.	Due to decaying organic matter; (many kinds are poisonous).
Grass is yellow.	Lack of nitrogen due to: lack of fertilizer, excess moisture, low temperature. Nematodes.	Mold or webby growth (in spring).	Snow mold (near-freezing temperatures and excess moisture).
Dead patches.	Damping-off.	Turf is thin.	Low nutrition, especially nitrogen, shallow topsoil, excess moisture (poor drainage), improper mowing height.
<b>ESTABLISHED LAWNS:</b>			
Browning of lawn.	Lack of moisture, improper cutting, white grubs, fertilizer burn, herbicide burn, disease.	Yellow-brown color.	Lack of nitrogen.
Circular brown areas in bents and bluegrass.	Brown patch (warm, humid weather). Dollar spot (usually cool weather).	Streaking of lawn (long narrow yellow strips in a dark green turf).	Uneven distribution of fertilizer.
Large areas of lawn are dead in the spring.	Smothering from leaves. Ice areas for skating, especially if soil is not frozen. Foot traffic across frozen turf.	Moss (or algae) in the lawn.	Low fertility, poor drainage, excess shade.
Rusty brown appearance.	Rust disease, can be severe on Merion bluegrass, low nitrogen, dull mower blades.	Lawn is bumpy, small circular spots, tunnels.	Earthworm casts, ants, moles, improperly graded.
Dusted with flour appearance.	Powdery mildew, slime mold.	Bees in the lawn (sting bare feet).	Bees associated with clover in the lawn, wasps.
Blades of grass have small yellow spots.	Leaf-spot disease.	Bluegrass lawn, infested with bent grass.	Caused by small amount of bent grass seed in seed mixture, soil, sod.
Clover in excess.	Low nitrogen.	Mower cuts with difficulty.	Mower needs to be sharpened, turf not cut frequently enough.
		Lawn is weedy.	Turf in poor vigor, turf cut too close, high weed population in area.



Water each 1,000 square feet area separately immediately after application or the grass will be burned. Do not apply to damp turf.

(C) Labor Saver: If you have used program (A) for the last 3 to 5 years you may use a Ureafoam fertilizer program instead of (B). This form of fertilizer does not become available until after the temperature of the soil is above 60°F but is less dangerous to use because it will rarely burn the grass. One application is generally sufficient because the nitrogen is available over a long period. Although this formulation is somewhat more expensive, the saving in the labor for application often compensates for the higher cost of fertilizer. Usually 5 pounds of Ureafoam fertilizer per 1,000 square feet of Kentucky Bluegrass (double amount for Merion) applied as the grass begins to turn green is the most simple system to keep your lawn green for one whole season.

Program (B) may be used in early spring, if necessary, to supply the needed nitrogen until the soil warms up.

Remember to use only one method (A), (B) or (C). Make your choice according to your preference, the past history of your lawn and the availability of the fertilizer locally. Calculate the size of your lawn area, be sure to omit the area covered by your house and paved area and buy the amount of fertilizer that is required.

## Applying fertilizer

Some manufacturers indicate on the container the number of the size of the opening on the fertilizer spreader, and this makes the whole matter of application extremely simple. If you do not know the proper setting, weigh out half the amount of fertilizer that is recommended for 1,000 square feet (for example, an area 50 x 20). Stake this area out and keep adjusting your spreader until the amount of fertilizer just covers a 1,000 square feet area. Once this adjustment has been found, the rest of the lawn can be covered using the same opening. But make sure that the adjustment on the fertilizer spreader is fastened firmly.

Once you have covered the lawn in one direction with one half the fertilizer, apply the other half by walking at right angles to the original direction. This minimizes streaking due to uneven distribution of the fertilizer. Fertilizer may be spread by a rotary type machine which throws the fertilizer for greater distances and consequently takes less walking.

## Watering

During dry periods in the summer and fall, and even if there are dry periods in the spring, you will need to water your lawn thoroughly to keep it attractively green. Water about once every week, unless there has been sufficient rain, so that the water penetrates to a depth of 6 to 8 inches where the bulk of the grass roots are located.

## Cutting

Never cut a Bluegrass lawn shorter than 1½ inches. Keeping the grass long prevents many weeds from germinating, helps smother the weeds and keeps the lawn in a much more healthy condition.

## Weed control

If weed seeds blow in to your lawn from a neighboring area, or if your lawn has had a serious crabgrass infestation in the past few years, it will be necessary to chemically control the weeds.

To control broadleaved weeds (dandelion, plantain, etc.) use a commercial weed killer as recommended on the container. Apply it in April soon after the grass is green and again in September. To control crabgrass use any of the commercial crabgrass chemicals that are on the market. Apply them exactly as recommended on the container and by the time the forsythia blooms.

Weed problems can be reduced considerably by good turf management. Follow a good fertilizer program and do not cut the grass too short. *Caution.* Do not apply weed-and-feed fertilizers under or close to valuable trees and shrubs. Watersoluble weed-control chemicals, although good for eradicating weeds, may cause damage in the form of twisting and chlorosis to woody plants.

## Seeding

Area for seeding should be cultivated to at least a depth of 8 inches, rolled and raked to produce a fine level seedbed. The best time to seed lawns in southern Michigan is around Labor Day and a week earlier in the upper half of the lower peninsula and in the upper peninsula. Bluegrass seeded at the rate of one pound per 1,000 square feet for sunny locations and Red Fescue at one pound to 1,000 square feet for shady locations produces the best lawns. Mix the seed for the area to be sown with enough clean, dry soil to dilute it for the even spreading. After the lawn is seeded, rake it gently and water the lawn as frequently as is needed to keep the surface moist. Do not begin mowing until the grass is 2½ to 3 inches tall.

# Spring flowering bulbs

By AUGUST DE HERTOGH  
Department of Horticulture

Spring flowering bulbs provide the home gardener with a variety of interesting plant materials. One can select from an exceptionally wide range of colors and types, as well as plants with varying heights and flowering times. There is something for every garden. There are deep blue hyacinths, bright yellow daffodils, or hot pink tulips. They can be as small as a white Crocus or as tall as the majestic Darwin tulips. Spring flowering bulbs are the first sign of spring and can be grown in almost any spot in the garden.

## Planning

The key to successful gardening with spring flowering bulbs is fall planning. Here are a few hints to follow. First, select the type of bulbs which will accent your garden. As you do this, take into consideration the time you want the plant to flower. (See Time Table below). For instance, Crocus flower very early in the spring, followed by daffodils, hyacinths and specie Tulips and later by most of the tulip varieties. Second, purchase only *firm, healthy* bulbs. When buying tulips, it is not important that the bulbs have a whole skin, or tunic, as it is called. In fact, it is a good practice to carefully remove the skin before planting.

## When to plant

In most areas in Michigan, the bulbs should be planted in *September* and *October*. The sooner they are planted in the fall the better. This is necessary

since they must make roots before the onset of the cold weather.

## Where to plant

Spring flowering bulbs must be placed in a well-drained area. This is very important. They will do very well in clay or sandy soils as long as the water does not stand for long periods after a rain. Whenever possible, add either peat and/or sand to the area to provide the bulbs with a good soil mix. This is a good gardening practice regardless of the plant material.

## Culture

When planting the bulbs, consult the Planting Depth Guide and the information given on page 18. The general rule is: Small bulbs shallow and large bulbs deep. This is the same practice used to plant vegetable or flower seeds in the garden.

To assist in developing a good root system, loosen the soil beneath the bulbs. Also, work in some bone meal or a complete fertilizer, like 5-10-5. Then *place* the bulbs at the proper depth. Do not force them in. Cover the bulbs with loose soil until the nose of the bulb is just covered, then water the bulbs thoroughly. Place the remainder of the soil over the bulbs and water again. When this is done, the whole planting bed is moistened and the bulbs can begin to develop roots immediately. Once planted, the bulbs require little or no care until spring. The major point to



CROCUS



GRAPE HYACINTH



SQUILL

watch for in the fall would be a lack of rain. Should the fall be dry, the bulb area should be watered to keep the soil moist.

In the spring, when the plants begin to emerge, they should be fertilized to help in producing the new bulbs for the following year. To assist in bulb production, the flowers should be removed from the floral stalks after the petals lose their color. The plants should then be allowed to stand until the foliage dies. It is important that the foliage be left to die. If this is not done, the bulbs cannot replenish their food supply for the next season's growth.

In Michigan, it is not necessary to lift and store the bulbs during the summer. They can be left in the ground. If, however, one wants to change the garden layout or the bulbs were not sufficiently attractive in the spring they should be removed and new bulbs purchased in the fall.

### Time Table for Spring flowering bulbs

**Early** — *Galanthus*, *Crocus*, *Scilla siberica* and *turbergeniana*, *Anemone*, *Eranthis*, Species Iris, *Chionodoxa*, *Muscari* and Specie Tulips.

**Medium** — Most Daffodils, *Fritillaria meleagris*, Single and Double Early Tulips, Mendel Tulips, Triumph and Darwin Tulips and Hyacinths.

**Late** — Some Daffodils, *Allium*, *Scilla campanulata*, Dutch Iris and Lily — Flowering, Cottage (Single Late), Rembrandt, and Parrot Tulips.

### Types of Spring flowering bulbs

Consult your bulb dealer or garden center charts for the assortment of bulbs available in your area. Also ask him for any literature which he may have available on Spring flowering bulbs.

#### MAJOR BULBS

**Tulips** — There are 15 classes of tulips ranging from the very early and colorful specie tulips to the highly specialized types such as the parrot or lily-flowering tulips. They come in all heights, colors and flowering times. Plant specie tulips 4 to 5 inches deep and all other types 6 to 8 inches deep. They should be spaced about 6 inches apart and look best when planted in groups.

**Hyacinths** — Hyacinths are available in white, pink, red, violet and yellow. They all flower about the same time and at a height of about 12 inches. Hyacinths are exceedingly fragrant and do very well in groups. They should be planted 6 to 8 inches deep and spaced about 4 inches apart.

**Daffodils** — There are 11 divisions of daffodils. This gives the gardener a wide variety of colors (both solid and bicolor), heights, flowering times and types of flowers. Daffodils generally do very well since they will naturalize to an area and remain productive for many years. They should be planted 8 to 10 inches deep and spaced about 6 inches apart.

**Bulbous Iris** — There are many colors and types available. There are the small (6 inches), very early, specie iris, which come in blue, yellow and purple. Also, there are tall growing types like the Dutch Iris which can be white, yellow or blue. The specie



HYACINTH



EARLY FLOWERING  
TULIP



DAFFODIL



LATE FLOWERING  
TULIP

Iris should be planted 2 to 3 inches deep and spaced about 3 inches apart. The Dutch iris should be planted about 4 to 5 inches deep and some 6 inches apart.

#### MINOR BULBS

**Allium** — These are ornamental cousins of the onion and chives. They come in white, yellow, lilac and rose and usually flower late in the spring. They range in height from 2 to 5 feet. The bulb size varies. The rule of the thumb is to plant them at a depth 3 times the height of the bulb. They prefer a sunny spot in the garden.

**Anemone** — Only the *Anemone blanda* group should be used. They come in pink, blue, white or rose. Plant them 6 inches apart and 3 to 4 inches deep. It is advisable to mulch this particular tuber for the winter. They are generally 6 to 12 inches tall at the time of planting.

**Chionodoxa** (Glory-of-the-Snow) — Plant 3 inches deep and about 2 to 3 inches apart. They come in pure white, gentian-blue, with a white center or rose and are usually 6 inches tall at flowering.

**Crocus** — Plant the corms 3 to 4 inches deep and 2 to 3 inches apart. They come in violet, white, yellow, striped and blue. They are very short (6 inches) and among the first flowers of spring.

**Eranthis** (Winter Aconite) — Set the tubers 2 to 3 inches deep and space them about 3 inches apart. The common form is a yellow flowering tuber. They do well in shaded areas and will tend to naturalize.

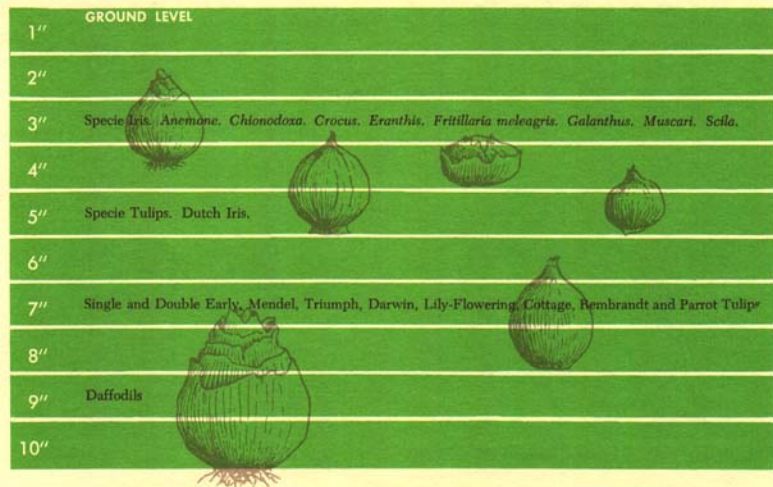
**Fritillaria meleagris** — These plants grow to a height of 18 inches and usually have 2 or 3 flowers per stem. They generally come in mixed colors and will naturalize. They should be planted 3 to 4 inches deep and about 3 inches apart.

**Galanthus** (Snowdrops) — They do well in shaded areas and grow to a height of 8 to 12 inches. The common type is white. Plant them 3 inches deep and 3 inches apart.

**Muscari** (Grape hyacinth) — They should be planted 3 inches deep and 1 to 3 inches apart. These plants will flower very early in the spring. They generally are 4 to 8 inches tall and come in white or blue.

**Scilla** — There are two types of Scillas. The Siberian Squills (*S. siberica* and *S. tubergeniana*) which flower early and are either white or blue and the Spanish bluebells (*Scilla campanulata*) which flower late and are pink, white or blue. The Siberian Squills should be set 2 to 3 inches apart and about 3 inches deep. The Spanish bluebells should be planted 4 to 5 inches deep and about 4 inches apart.

### Planting depth guide



# Flowering Annuals and Bedding Plants

By W. H. CARLSON  
*Department of Horticulture*

Annual plants produce flowers during the first season they are grown and either produce seeds and die or are killed by low temperatures in the fall. Consequently, some plants that may be perennials in a warmer climate are grown and treated as annuals in Michigan.

Annuals provide "instant color" to your landscape. By purchasing them as mature plants in flats you can fill in bare spots in your yard. It gives you an opportunity to become an exterior decorator by using various colors and heights to accent your home, apartment or landscape.

Annuals are the easiest plants to grow and also the least expensive. These two advantages make gardening with annuals very popular.

Four points must be considered to grow annuals successfully:

1. Buy fresh, clean seed or flats of transplants that are dark green in foliage color short in height and free of insects and diseases.
2. Prepare soil in flower beds or planters properly.
3. Do not plant until damage of frost is over.
4. Make certain plants are properly spaced, watered when needed and kept free of dead flowers or yellow foliage.

## Selecting annuals

There are many types of annuals with various colors and heights. Review the accompanying list of selected annuals to determine the colors and heights you want for your garden.

Be sure to buy disease-free plants or seed. The best way to obtain the highest quality annuals is to buy seedlings or flowering annuals from your local greenhouse or garden center. Michigan ranks first in bedding plant production so there should be a large selection available from which to choose. However, the other alternative is to sow fresh seed in flats and then transplant the seedlings to the desired area.

## Sowing seed

Seed should be sown in a small area thoroughly prepared with peat and sand so the soil will not cake

and prevent entry of water. To avoid this, sow the seed in vermiculite-filled furrows. Make the furrows in the soil about one-half inch deep. After filling the furrows with fine vermiculite, moisten with water.

Then make another shallow furrow in the vermiculite and sow the seed in this furrow. Sow according to directions on packet. Cover the seed with the vermiculite and use a mist nozzle to water the seeded area thoroughly (Caution—small seed such as petunias are sown on soil surface and not covered).

To retard evaporation of water, cover the seeded area with sheets of newspaper about 1 to 2 inches above the soil surface or enclose the container in a plastic bag. Once seedlings appear, remove the paper or plastic but keep thoroughly watered.

Transplant these seedlings and space them out according to the accompanying table.

## Preparing the soil

Garden soil must be properly prepared to insure good growth of annuals.

In spring just before planting, add a 1 to 2-inch layer of peat moss. If your soil is a heavy clay, use twice the amount of peat moss and 1 to 2 inches of sand. By adding peat and sand to your soil you will eventually improve even poor subsoil to make a good garden soil.

Also, a complete fertilizer should be added at this time—about 2 pounds of 5-10-5 to every 100 square feet of soil; then turn over the soil and rake to a smooth surface. After raking, the soil will be ready for seeding or planting with seedlings.

## Setting plants out

Annuals vary in their light requirements. Some perform best in shade while others perform best in full sunlight. Some annuals do well in either sun or shade. See the table for the amount of light that each plant requires.

## Watering annuals

Do not rely on natural rainfall to take care of all the water needs of your annuals plants. In some years rainfall will be sufficient to produce fine annuals.

However, in Michigan most plants require watering at various times to supplement the rain. Do not use a sprinkler or water tops on annuals. Splashing water damages flowers on many annuals, especially petunias and geraniums.

Many diseases start when free moisture remains on the foliage for more than 48 hours. It is true rain will create this condition and it usually takes a few days for the annual to recover from heavy rain. Water the plants at soil level to get as little moisture as possible on foliage. This can be done easily with a watering wand that is available from most garden centers, or place a soaker type hose or plastic watering system in the flower beds. These systems give water to the roots of the plant while the foliage remains dry.

Plants should be watered thoroughly and less often rather than lightly and often. This builds deep roots that will produce stronger plants.

### Fertilization

When the flower bed is initially prepared, 2 pounds of the 5-10-5 or 10-10-10 fertilizer should be applied per 100 square feet of flower bed. This should be incorporated into the soil and worked in with the peat moss to make the flower bed acceptable for annuals. Then plant the annuals at the proper spacing according to the listed table and allow them to grow for about 6 to 8 weeks before adding more fertilizer.

The amount of fertilizer depends on the amount of rainfall or water applied to the plants. In general, the more water applied to the plants the more frequent the fertilization. When more fertilizer is needed, apply a 5-10-5 or 10-10-10 at the rate of 1 pinch (that amount of fertilizer you can hold in your thumb and first and index finger) to each plant. Make sure the fertilizer is not in contact with the foliage of on the crown of the plant. If fertilizer comes in direct contact with the plant, it may burn the foliage. Place it between 1 to 2 inches from the stem of the plant in a circle around the plant. Remember that it only takes a small amount of fertilizer to make plants grow, and if you apply too much the plants will wilt even when wet and finally die.

### Overwatering annuals

All the annuals listed in the table are not winter hardy in Michigan. All will die when exposed to a few heavy frosts, so you will have to grow new plants

from seed or buy new plants each year. It is rarely worthwhile to save seed or annuals from one year to another, or collect your own seed. Frequently they will not grow true to type. However, if you wish to save seed, choose them from healthy plants where the flowers have been left to set seed and grow to maturity during the summer. As soon as the pods are brown, place them in a cool, airy place. When they are completely dry, remove the seeds and store them in small paper bags.

Many annuals can be overwintered by taking terminal cuttings from plants just before frost. Coleus, geraniums, wax begonias, impatiens and ageratum can be successfully propagated by taking 2 to 3 inches of terminal stem with leaves, stripping the lower leaves off, leaving one or two sets of leaves on the top, then placing the cut end into a medium of sand or peat and vermiculite.

Cover the container with medium and the cuttings with a plastic bag, making sure the medium is moist at all times. Usually a period of 2 to 3 weeks will be required for rooting. Then pot in a 3- or 4-inch pot and place in a sunny window. Water and fertilize just as you do your other house plants. In spring when frost danger is over replant in your garden. This procedure will work well if the annuals receive enough light indoors but it will not work if they are placed in a dark area in your home.

### Use of annuals

Your imagination is the limiting factor in using annuals in your home and landscape. There are many interesting ways they can be used such as in wooden dividers, planted in chain link fences, in old shoes made as planters, in old bathtubs, sinks, etc.

The more conventional ways of course are in flower beds, urns, patio boxes, window boxes and in rock gardens. They can also be trained to grow like small trees or shrubs.

It is usually desirable to plant many of the same type of annual and same color of annuals in one area, instead of using only one or two plants of each type. Examples of nice flower beds would be a center of red geraniums with a border of blue ageratum or a center of pink petunias with a border of white alyssum.

Use the colors and heights wisely and you will add a new dimension of gardening to your home, apartment and landscape — "instant color".

## Annual flowers - colors and heights

Plant	Color	Height Inches	Exposure	Plant Spacing Inches	Remarks
Ageratum	blue or white	6 to 18	Part or full sun	10	Pinch tips of plants to encourage branch; remove dead flowers.
Balsam	reds, pink, purples	20 to 30	Sun	12	Will not tolerate cold wet weather; good in planters or window boxes.
China Aster	blues, white, pinks	12 to 24	Sun or shade	10	Good for cut flowers.
Cockscomb	reds, orange, yellow	16 to 40	Sun or shade	10	Good for cut flowers or dried material.
Coleus	green and white, yellow, red, many mixtures	18 to 24	Sun	10	Grown for foliage color; good for planters or window boxes.
Cornflower	blue, pink, red	12 to 36	Partial shade	12	Good for cut flowers.
Cosmos	white, pink, crimson	30 to 48	Sun	12	Good for cut flower, background plant.
Dahlia	wide range of color: red, yellow, purple, orange, white	18 to 40	Sun	14	Good for cut flowers, bedding or background plants.
Four-o'clock	white, red	20 to 24	Sun	12	Good in formal beds.
Gaillardia	red, bronze, yellow	12 to 18	Sun	12	Source of cut flowers and plants for drying.
Globe Amaranth	white, purple, reddish purple	18 to 24	Sun	12	Source of cut flowers and plants for drying.
Impatiens	white, red, orange, purple	10 to 20	Shade	12	Beautiful for flower beds in shady area, good for cut flowers.
Larkspur	white, blue, purple	18 to 48	Sun	8	Difficult to transplant; buy in peat pots or cell packs; good for cut flowers.
Marigold	orange, bronze, yellow	6 to 30	Sun	12	Good for cut flowers, window boxes.
Morning glory	blue, pink	8 to 12	Sun	36	Vine type growth.
Nasturtium	orange, gold, salmon	10 to 12	Sun	12	Need well drained soil.
Pansy	red, yellow, blue, bronze mixtures	6 to 10	Sun or partial shade	8	Early spring flower, nice in rock gardens.
Petunia	almost every color, red, pink, blue, white, bi-color	8 to 24	Sun	14	Good for window boxes beds, bloom all summer.
Phlox	pink, white, salmon, pastel with white eye	6 to 12	Sun	8	Good in rock gardens.
Pink	pink	6 to 12	Sun	12	Good source of cut flowers.
Poppy	rose-pink, orange	12 to 16	Sun	10	Good source of cut flowers.
Portulaca	red, pink, yellow, white	6 to 9	Sun	12	Good in rock gardens.
Rudbeckia	yellow, dark center	20 to 24	Sun or partial shade	12	Good source of cut flowers.
Scabiosa	mixed colors	18 to 36	Sun	14	Good source of cut flowers.
Salvia	red, pink	14 to 36	Sun	12	Used as border plants.
Snapdragon	red, yellow, bronze, white, pink	10 to 36	Sun	10	Good for cut flowers.
Spider plant	pink and white	30 to 36	Sun	14	Good background plant.
Stock	white, pink, blue	24 to 30	Sun	10	Good for cut flowers.
Strawflower	yellow, yellow black center, red, brown, gold	30 to 40	Sun	12	Good source of cut flowers and plants for drying.
Summer Cypress	green	30 to 36	Sun	24	Grown for foliage, used as a hedge.
Sunflower	yellow, dark center	48 to 84	Sun	14	Used as background, source of cut flowers.
Sweet Alyssum	white or blue	6 to 10	Sun	12	Good border plant.
Verbena	purple, white, red, blue	9 to 12	Sun	24	Source of cut flowers.
Vinca	white purple	15 to 18	Sun	12	Good plants for window boxes.
Zinnia	red, rose, yellow, orange, pink, purple, cream	18 to 36	Sun	12	Source of cut flowers.

# Perennial flowers, vines, and groundcovers

BY ROY A. MECKLENBURG  
*Department of Horticulture*

Flowering perennials properly cared for last almost indefinitely. Herbaceous perennials like the peony or iris grow new stems, leaves and flowers each year which die down to the ground in the fall, thus escaping winter stress. These are replaced by new growth the next spring. They may be more expensive originally than annual plants (those that grow from seed, flowers and dies the same year) but in the long run perennials are more economical.

Perennials can be a substantial part of most home landscapes. They provide flowers from early summer until late fall, vary in size, texture, form and flower color and have wide ranges of adaptability to various soils, degree of shade and climate. Once perennials are established they multiply rapidly and some require dividing and thinning every 3 to 5 years. Others remain permanent and undisturbed as the name implies. A few varieties of perennials planted in a mass probably produce more color for the investment than any other permanent planting.

## Arrange your planting

When planning your garden or home landscape you are using colors in much the same way an artist or interior designer would use them. Selection of the color of flowers to use is a personal matter. Use colors that appeal to you, possibly those which complement the colors in the interior of your home. The flower colors should also blend with the color of your house and other architectural features. Light colors, white, pink and yellow are more easily seen at night and are most effective with the night lighting that you may have near the entrances to your home. Blue and lavenders are peaceful, cool colors as contrasted to energetic, warm reds and oranges. Generally, larger plantings with a single or limited combination of colors are more effective than many different colors mixed together.

Since many perennials produce spectacular flowers for only part of the season you have the opportunity to change color combinations as the season progresses.

## Timing

You should plan your garden for at least 3 seasons. Develop spring, summer and fall color combinations and then select perennials flowering at the appropriate time of year. Consider combining flowering perennials with annuals and flowering shrubs for additional interest and color.

## Spacing

Plans for the use of flowering perennials should be coordinated with the entire landscape. Perennials should be staged with tall plants in the rear and low plants at the front. The flower colors should be the accent in the landscape design and should be used where they will be seen most frequently. You may also wish to develop a less public planting specifically for cutting flowers for use in arrangements.

## Plantings

Flowering perennials are relatively trouble-free plants, particularly when the site (moisture, shade, soil and wind exposure) is appropriate for the plant. Most perennials have few insect or disease problems and are vigorous plants in a loose moist soil with good drainage. The addition of organic matter and installation of drain tile in heavy soil is well worth the trouble. It will save considerable time later if the most noxious weeds are eliminated before planting and a light mulch is used after planting to conserve moisture and control weeds. Fertilizer applications should be made sparingly since most flowering perennials easily suffer from over-fertilization.



## These are good perennials

(arranged according to flowering time)

April



NAME	COLOR	HEIGHT (inches)	CHARACTERISTICS
Alyssum ( <i>Alyssum saxatile</i> )	yellow, gold	15	'Basket of Gold', good with tulips.
Anemone, Pasque Flower ( <i>Anemone pulsatilla</i> )	purple	12	Cool location, moist soil.
Dwarf Bleeding Heart ( <i>Dicentra exima</i> )	pink	18	Lacy, attractive foliage and flower.
Dwarf Iris ( <i>Iris reticulata</i> )	purple	8	Vigorous, blooms into May & June.
English Daisy ( <i>Bellis perennis</i> )	red, pink, white	6	Cool, moist soil, does best in partial shade.
Primrose ( <i>Primula spp.</i> )	violet, yellow, red	8-15	Best in cool, moist, partial shade, continues to bloom into May.

May



Bleeding Heart ( <i>Dicentra spectabilis</i> )	rose, and white	30	Lacy foliage, foliage gone by mid-summer.
Coral Bell ( <i>Heuchera sanguinea</i> )	red, pink, white	18	Small flowers, excellent cut flowers from May to October.
Dwarf Phlox ( <i>Phlox subulata</i> )	pink, blue, lavender, white	6	Vigorous, covers rapidly, full sun.
Geum ( <i>Geum coccineum</i> )	red, orange, yellow	4-36	Attractive double flowers, sensitive to excessive soil moisture.
German Iris ( <i>Iris "pogontrii"</i> )	yellow, pink, blue, white, purple, bronze, etc.	36	May-June flowering, some again in fall.
Iceland Poppy ( <i>Papaver nudicaule</i> )	red, orange, pink, white	18	Delicate, will self-seed, flowers from May to October.
Oriental Poppy ( <i>Papaver orientale</i> )		36	Vigorous with single or double flowers, foliage gone by mid-summer.
Violas ( <i>Viola cornuta</i> )	red, violet, yellow, purple, white	8	Excellent in shade, cool moist soil.

## June



NAME	COLOR	HEIGHT (inches)	CHARACTERISTICS
Columbine ( <i>Agulegia hybrida</i> )	blue, white, pink, purple, yellow	36	Long spurred hybrids are best and most vigorous.
Daylily ( <i>Hemerocallis spp.</i> )	yellow, orange, bronze, pink	12-50	Some are scented, flower May to October, vigorous plant.
Foxglove ( <i>Digitalis purpurea</i> )	lavender, purple, white	24-60	Self-seeding biennial, best in partial shade.
Gas Plant ( <i>Dictamnus albus</i> )	pink, white	36	Unusual flower, gives off an inflammable gas.
Peony ( <i>Paeonia lactiflora</i> )	pink, white, red	30	One of the best perennials, single and double flowered, double require staking.
Painted Daisy or Pyrethrum ( <i>Chrysanthemum coccineum</i> )	red, pink, white	30	Single and double daisy-like flowers until August with fern-like foliage.
Shasta Daisy ( <i>Chrysanthemum maximum</i> )	white with yellow center	36	Large daisy flower, single and double flowers into July.
Sweet William ( <i>Dianthus barbatus</i> )	red, pink, white in combinations	24	May to early July flowering, biennial, reseeds itself yearly.
Siberian Iris ( <i>Iris siberica</i> )	rose, blue, violet, white	36	Vigorous, should be divided every 3 to 4 years.
Veronica or Speedwell ( <i>Veronica latifolia</i> )	purple, blue, pink, white	36	Long spikes of flowers from June to September.
Yarrow ( <i>Achillea filipendulina</i> )	yellow, pink	36	Large, flat flowers with gray-green fern-like foliage from June to September.

## July



NAME	COLOR	HEIGHT	CHARACTERISTICS
Babysbreath ( <i>Gypsophila paniculata</i> )	white, pink	36	Fine lacy foliage and flowers through August.
Beebalm ( <i>Monarda didyma</i> )	red, pink, white	42	Scented foliage, spreads rapidly.
Coreopsis ( <i>Coreopsis lanceolata</i> )	yellow, bronze	30	Very prolific flowering plant.
Delphinium ( <i>Delphinium elatum</i> )	blue, white, purple, pink	40	Tall spikes, new hybrids best.
Caillardia ( <i>Caillardia x grandiflora</i> )	yellow, red, orange	36	Daisy-like flowers.
Hollyhock ( <i>Althea rosea</i> )	white, pink, rose, maroon, red	60-100	Good background plant, double and single flowered, self-seeding biennial.
Astilbe ( <i>Astilbe x arendsii</i> )	white, pink, red	28	Lacy foliage, flowers last into August.
Phlox ( <i>Phlox paniculata</i> )	white pink, salmon, purple	36	Large, showy, flowering into August.

August



NAME	COLOR	HEIGHT (inches)	CHARACTERISTICS
Black Eyed Susan ( <i>Rudbeckia speciosa</i> )	yellow with black center	24	Rough leaves, good cut flower.
Cardinal Flower ( <i>Lobelia cardinalis</i> )	red	48	Spectacular red flowers, does well in wet soils.

September



NAME	COLOR	HEIGHT	CHARACTERISTICS
New England Aster ( <i>Aster novi-angliae</i> )	pink, white, violet, blue	48	Large plants with considerable variation in flower size.
Plantain Lily ( <i>Hosta plantaginifolia</i> )	lavender, white	24	Large attractive leaves, grows in shade.
Stonecrop ( <i>Sedum spectabile</i> )	red, white	18	Fleshy, gray-green foliage, flowers August to frost.

PARTIAL SHADE

Bebalm	Plantain Lily	Alyssum	Shasta Daisy
Bleeding Heart	Primrose	Dwarf Phlox	Sweet William
Columbine	English Daisy	Iris	Stonecrop

DRY SUNNY SITES

These are good vines or groundcovers

(Lose Leaves In Fall)

NAME

REASONS WHY

EVERGREEN

Ivy  
(*Hedera helix*)  
Winter Creeper  
(*Euonymus vegetus*)

The Baltic and Bulgarian strains are more hardy. Excellent on ground or walls with north exposures.  
Hardy and holds leaves all winter, attractive bittersweet-like fruit.

NON-EVERGREEN

Honeysuckle  
(*Lonicera japonica halliana*)  
Porcelain berry  
(*Ampelopsis brevipedunculata*)  
Rambler Roses  
(*Rosa* spp.)

Large, very vigorous vine with fragrant orange or white flowers; withstands poor soils and exposed dry sunny sites.  
Moderately vigorous vine with 3 lobed leaf and turquoise-blue berries.  
Climbing roses must be tied to a support or will ramble over the ground.

## These are good groundcovers

(In Winter Leaves are Unattractive if Present)

NAME	REASONS WHY
<b>EVERGREEN</b>	
Creeping Juniper ( <i>Juniperus horizontalis</i> )	Many good varieties with green or blue-green feather-like foliage.
Japanese Spurge ( <i>Pachysandra terminalis</i> )	One of the better common groundcovers, excellent in shade with uniform growth.
Thyme ( <i>Thymus serpyllum</i> )	Common aromatic herb, fine compact foliage.
Vinea or Myrtle ( <i>Vinca minor</i> )	Good in moist, shaded locations, very tough plant. Grass, weeds must be completely removed before planting.
Evergreen Candytuft ( <i>Iberis sempervirens</i> )	Showy, white flowers in May with dark green leaves.
Canby Pachistima ( <i>Pachistima canbyi</i> )	Dark green, fine-leaved groundcover, useful in sandy soil in partial shade.
<b>NON-EVERGREEN</b>	
Carpet Bugle ( <i>Ajuga reptans</i> )	Green, bronze or variegated leaves with small blue, white or lavender flowers, good in partial shade.
Lily of Valley ( <i>Convallaria majalis</i> )	Shiny, dark green leaves with spikes or pink or white, fragrant flowers, best in full shade.
Prostrate Cotoneaster ( <i>Cotoneaster adpressa</i> )	Dark green, small, shiny leaves with attractive red berries in fall.

## These are good vines

(Lose Leaves In Fall)

NAME	REASONS WHY
Clematis ( <i>Clematis jackmanii</i> )	Many large flowering vigorous varieties, with blue, pink, red or white flowers, best in full sun, needs trellis.
Bittersweet ( <i>Celastrus scandens</i> )	Vigorous vine in full sun, has yellow and red fruit which last into winter. Needs support.
Wisteria ( <i>Wisteria sinensis</i> )	Has lavender or white hanging clusters of flowers, needs support.

# Roses around the home

GARDEN ROSES are perhaps the most prized of any plant. There is a common belief that roses are more difficult to grow than many other garden plants, but the satisfaction from growing your own roses can be rewarding and it is by no means time consuming if you adopt the following simple directions.

## How to use roses in the garden

Whether you are already growing roses or not, it is likely that you will want to have new ones from time to time. You may want to replace some you are already growing or you may have lost some as a result of a severe winter. There is no need to restrict your rose planting to isolated beds that are separate from the rest of the garden. Put them in quantity where you want a colorful show. Remember that by planting roses as shrubs in borders and in larger quantities you will have lots of flowers on a permanent plant for a long time.

## What to look for

Whether a new rose bush comes in a bundle where its moist, bare roots have been packed in peat moss or sawdust, whether it is a potted or package plant makes very little difference, as long as you purchased it early in the spring. Bushes should be sturdy with healthy, light brown or white roots, have 3 to 5 strong stems, over a half an inch in diameter. These stems should be green and the buds completely dormant.

Potted rose bushes can be planted at any time of the year, will be in leaf and sometimes in flower when they are purchased. Rarely does it harm a bush to have been covered with a light coating of wax. All plants on the market in Michigan have been care-



fully scrutinized by the Bureau of Plant Industry to protect the home owner from buying damaged or improperly labeled material.

## What to avoid

A poor plant is one with weak, spindly growth. Frequently it will have started to grow in the bin and will have a number of soft, long, thin, greenish-white shoots instead of buds. Sometimes they have been so heavily waxed that the buds are smothered or the roots and stems may have withered and died.

## Hybrid teas

- Red — Aida, Americana, Bob Hope, Charlotte Armstrong, Christian Dior, Chrysler Imperial, Crimson Glory, Hawaii, Miss All-American Beauty, Mister Lincoln
- Orange — Lucy Cramphorn, Samoa, Sutter's Gold, Tanya, Thanksgiving, Tropicana
- Yellow — American Heritage, Champagne, Delightful, Golden Glow, King's Ransom, Summer Sunshine
- Pink — Ame Letts, Bewitched, Camelot, (Grandiflora), Confidence, First Prize, Granada, Pink Favorite, Pink Fragrance, Pink Masterpiece, Pink Peace, Pink Princess, Queen Elizabeth (Grandiflora), Royal Highness
- White — Garden Party, John F. Kennedy, Matterhorn, Pascali, White Knight, White Wings, Dresden
- Bi-Color — Countess Vandal (pink and salmon)
- Duet (med and light pink)
- Peace (creamy yellow, pink edge petals)

## Floribundas

- Red — Europeana, Fusilier, Ginger, Lili Marlene, Red Pinocchio, Roman Holiday, Wildfire, World's Fair
- Pink — Betty Prior, Border Gem, Daily Sketch, Fashionette, Gay Princess, Gene Boerner
- Orange — Golden Slippers, Orangeade, Sarabande, Spartan, Summer Song, Zambra, Zorina
- Salmon — Oberon
- Yellow — Moonsprite
- White — Dagmar Spath, Saratoga, Shasta, Snow-Fairy, Summer Snow
- Lavender — Lilac Charm
- Bi-Color — Rumba (gold and red)

## Climbers

- Red — Don Juan
- Pink — Coral Dawn, Coral Satin
- Yellow — Gold Rush
- White — White Dawn

Small savings that are realized in the purchase of cheaper and inferior plants are always at the expense of a sacrifice in quality.

### Kinds of roses

Home owners must be puzzled when faced with the multitude of rose varieties, a dazzling array of colorful packages and the wide range of prices.

On the bottom of page 26 are some of the varieties that are recommended. While there are many others, you can't go wrong with any of these providing you insisted on a good quality bush at the time you purchased it.

If you want roses for cutting, for size, or for down-right pleasure in your garden, hybrid teas are the most satisfactory. Hybrid Teas make the biggest, showiest flowers of all.

If, however, you want to have more flowers, and wish to give the bushes less attention, plant more floribundas and climbers. Floribundas are more often used for bedding. The flowers are not as large, grow in clusters, and bloom from June throughout the rest of the season.

Climbers are ideal for trellis or ground cover.

### Planting is simple

Dig a hole large enough to accommodate the roots, wide enough so that they can be spread out in a natural position. Make the hole deep enough so that the crook in the main stem is just below the surface of the ground after the soil has been leveled. Prune off the injured portions of any broken or diseased roots. Set the plant on an inverted cone of soil and cover the roots with good garden soil. After packing this soil firmly with your hands, fill the hole with more top soil and firmly tamp it in place with your feet. After making a saucer of soil around the plant, pour 2 or 3 gallons of water on each plant. Prune the top of the bush to 6 or 7 inches in length, removing the small weak stems. Most bushes should be planted 2 to 3 feet apart depending somewhat on the vigor of the variety.

### Cultivate

Unless the rose garden is mulched with well rotted cow manure, peat moss, buckwheat hulls, corn cobs, etc., the soil should be given a shallow cultivation every few weeks during the summer.

### Fertilizer and Foliar Feeding

An application of a well balanced fertilizer (5-10-10) should be applied at the rate of 2 to 3 pounds per hundred square feet of rose bed. This should be

applied at three times: one handful in a ring around each plant just as the leaves are appearing, another just as the plants are flowering, and another immediately after flowering. If the fertilizer is scratched into the soil just before a rain, it will prevent washing of the fertilizer.

By adding one teaspoon of ammonium nitrate and one teaspoon of potassium nitrate to each 2 gallons of made-up spray material, the roses can be sprayed for pests and fertilized through the leaves at the same time. In this case, dry fertilizer is applied to the soil only in early April and repeated in late October. The phosphorus in a complete soluble fertilizer inactivates certain insecticides and should not be combined with pesticide spray combinations.

### Water well

During the growing season if there is more than one week of weather without reasonably good rain, place the sprinkler in the garden and let it run for at least four hours.

### Spray or dust

Purchase an all purpose spray or rose dust. Use it exactly as it is recommended by the manufacturer, once a week. If there is a heavy rain and the residue is removed from the leaves, spray or dust again following the rain. Be sure to spray or dust the plants after each heavy watering.

### Prepare for winter

*In late fall when the air temperature is near 40° F* spray the plants thoroughly with "dormant lime—sulfur" recommended on the package. Collect and burn all fallen leaves, remove and destroy any plants that have abnormal swellings on the roots, crowns or stems.

*After you have had two heavy freezes*, water the roses thoroughly unless you have had a good supply of rain. Draw the canes together with a circle of plastic tape or cotton cord so that they form a bundle about uniform length. Use 12" tarpaper cylinders or purchase special rose protecting cylinders. Once the bushes are tied together, the cylinders can be slipped over the bush and a mulch of dry vermiculite or corn cobs, perlite or other material is placed into the cylinder. Cut off plant tops even with cylinder edge, and cover with polyethylene film to keep insulation material dry. Anchor film firmly to prevent wind damage.

*After the ground has been frozen solid* in the late fall or early winter add a layer of evergreen boughs or straw over the rose bed. Never uncover the plants in the spring until the soil has thawed.

# How to diagnose problems on roses

## ENTIRE PLANT

### TROUBLE

When planted, fails to grow or grows very slowly.

### POSSIBLE CAUSES

Dead or damaged before planted. Roots dried out before planted. Freeze injury before planted. Canes dried out after planted. Poor soil drainage. Poor soil fertility (low phosphorus).

### POSSIBLE CAUSES

Black spot.

Rose mosaic.

Spray injury, overdose of fertilizer.

Insufficient water.

Spray injury, lack of potassium.

Lack of nitrogen.

Iron deficiency.

Rust.

Red spider mites.

Leaf-cutter bees

## FLOWERS

Flower buds die without opening.

Rose weevil, rose midge.

Deficiency of Calcium or Boron or Zinc.

Petals stick together, flowers fail to open.

Thrips.

Botrytis blight.

Certain varieties in cool weather.

Flower petals chewed.

Rose chafer, especially in June and July.

Grasshoppers, especially in July to October.

Petal edges indented.

Certain varieties in cool weather.

Blooms fewer than normal and weak growth.

Too much shade.

Variety unsuited to climate.

Insufficient fertilizer, water.

Flower color change.

If stem originates below soil line, it is a sucker from the rootstock.

If stem originates above soil line, it is a sprout of the plant.

Flowers produced profusely at 6 to 8 week intervals with no blooms at other times.

Typical of certain varieties.

Flowers droop due to stem weakness just under flower.

Too much shade.

Typical of certain varieties. Bright sunlight, high temperatures.

Color fading.

Some varieties fade easily. Less than 50% of varieties are fragrant.

No fragrance.

Dark brown spots with yellow zones on lower to middle foliage, followed by defoliation, develops rapidly.

Yellow streaks, blotches, usually only on some leaves.

Brownish leaf surface.

Brownish leaf margins.

Light green upper leaves, with yellow lower leaves.

Light green upper leaves, turning white, lower leaves green

Yellow or orange pustules followed by defoliation.

Grayish or yellowish fine speckling of leaves, small red specks on underside of leaf, fine webs and finally leaf drop.

Circular pieces cut on leaves.

## STEMS

Wilting and dying back of stem tips.

Borers especially in June or July, insufficient water, excessive fertilizer.

Brown or black blotches on stems.

Stem canker.

Greenish, soft-bodied insects, usually on stem tip and flower bud.

Aphids.

Wart-like growth at base of stem.

Crown gall.

Wild shoots from below ground line, usually seven leaflet leaves.

Sucker growth from understock.

Tip and upper stem with distorted foliage, tip may die, flower open abnormally.

Rose midge especially in June to September.

Twisting young stem, distorted foliage and flower.

2,4-D injury, herbicide damage, weed and feed type fertilizers.

## FOLIAGE

Upper leaves distorted, with powdery white deposit that cannot be wiped off.

Powdery mildew.

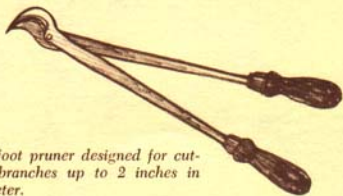
White blotches.

Leafhoppers.

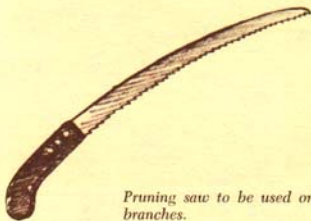


*Cut flush to side branch. Do not cut branches that are larger than  $\frac{1}{2}$  to  $\frac{3}{4}$  inches in diameter with hand shears.*

## Pruning practices



*Two-foot pruner designed for cutting branches up to 2 inches in diameter.*



*Pruning saw to be used on larger branches.*

### WHY PRUNE AT ALL?

- (1) To remove broken, dead, diseased and insect injured branches,
- (2) to produce a more sturdy and dense plant,
- (3) to control the growth of the plant and produce the desired size and shape, and
- (4) to improve flowering and fruiting.

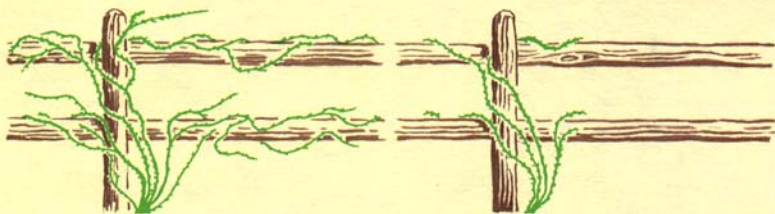
The act of pruning is to many people much more frightening than is necessary. Unless you make large drastic cuts, pruning can be done on a trial and error basis. The need for pruning can be reduced by selecting a plant of the desired size in the first place, and keeping this plant in a good healthy growing condition.

### When to prune

From the point of view of a plant itself, you can prune at practically any time of the year. Evergreen boughs can be cut from your evergreens for Christmas decorations, they can be cut from the shrubs before new growth starts in the spring or after it is completed in the fall.

Plants that lose their leaves in the winter can be more easily pruned during the dormant season because it is easier to see the framework of the branches.

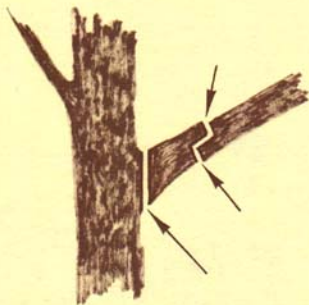




*Climbing rose before and after pruning. Pruning of rose is done immediately after the flowering has ceased.*

Shrubs that flower on new growth of the current season (roses, for example) are better pruned early in the spring to induce the production of flowering wood. Those that flower on last year's growth should be pruned soon after flowering has finished (e.g. Forsythia).

Since it is difficult to lay down any hard and fast rules about when to prune, gardeners can be guided by their own wishes and frequently suit the time to their convenience.



*When removing large branches make two cuts as shown so that there will be no tearing of the main stem. Never leave stubs of branches. Cut flush and parallel with the main stem. As soon as a large branch is removed either paint it with asphalt wound dressing or use an aerosol spray that is specially prepared for this purpose.*

## Roses

Prune Hybrid Teas and floribundas early in the spring before growth begins.

Weak plants need to be pruned more severely than vigorous plants. Canes of a typically healthy, vigorous Hybrid Tea are from 12 to 18 inches long after pruning. Less vigorous varieties should be pruned less severely (16 to 24 inches). In general, floribundas do not need to be pruned as severely as Hybrid Teas, but they are pruned in a similar manner.

Climbing roses should be pruned as soon as flowering has ceased. Remove all of the old stems that have produced flowers, cut back the new vigorous canes to the place where they are the size of a lead pencil or to suit the convenience of the size of your trellis or other support. As in Hybrid Teas and floribundas, the less vigorous varieties should be pruned less severely.

## Shrubs

Prune over-grown shrubs by removing the older discolored canes to the ground level. Reshape the clump by pruning back the branches to side shoots.

## Rejuvenation

Every 6 to 10 years, shrubs with a clump growth habit can be rejuvenated by being cut down to the ground. Do this immediately after flowering for those that flower on one-year-old wood, early in the spring if they flower on new growth. After cutting in this manner a completely new system of branches will develop from the established roots.



*By removing the tips of branches at least once a year, an evergreen can become more bushy if such is desired.*

Longer branches can be cut back to a side branch. New growth will fill in the space and make the shrub more bushy.

To make an evergreen even more dense new growth (like small candles on pines or spruce) can be cut in half soon after it has come out of the bud in the spring, or when 2 to 3 inches long.

### Ground covers

Trimming and training ground covers may require pruning to suit the location. Winter creeper, ivy, Pachysandra and other ground covers may be trimmed at will to suit the area in which you wish to maintain them.

### Vines

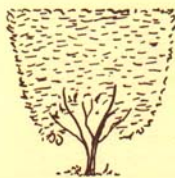
Many of the vines that lose their leaves in the winter will respond well to heavy cut-back in the

fall of the year. Vines need to be trimmed to keep them within bounds, away from windows, or in keeping with the trellis or other structure to which they are attached.

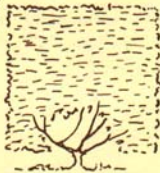
### Trees

At planting time trees should be trained and pruned to produce even distribution of the main branches. Other than that, pruning will consist mainly of removing dead and injured branches. When more drastic pruning is necessary, it would be appropriate to have this done by professional services.

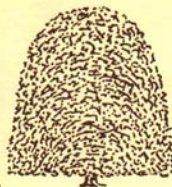
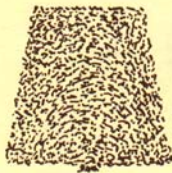
If an evergreen develops two or three central leaders, all but the most desirable leader should be removed in the early spring. If all of these are damaged, a side branch may be tied to a stake in a vertical position to replace the missing leader. Evergreen trees can be trimmed to suit the shape desired by the owner.



WRONG



RIGHT



*Since the sun needs to reach all the leaves and branches of a hedge, it is important to keep the top more narrow than the bottom.*

# Insects and diseases

BY WILLIAM E. WALLNER AND HOWARD S. POTTER

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Most flowers, trees and shrubs grown on home grounds are likely to be attacked by one or more pests some time during the growing season. Your ability to examine and detect initial insect or disease problems will reduce control measures over the long term. Try to make periodic inspections of your plantings and examine each plant individually.

For more specific information on insect control on ornamental plants, see Extension Bulletin 543, "Controlling Pests of Trees and Shrubs". This, and a number of other specific publications are available at your County Extension Office.

## Applying of sprays

While the time of applying spray will vary somewhat from year to year, and from one garden to another—depending upon the elevation, nearness to water, and to some extent the soil type—the use of all-purpose sprays without first diagnosing the causal agent is not recommended. Specific treatment for each insect or disease is most effective.

In general, fungicides should be applied immediately following rain. Spraying for aphids is more effective before the leaves have curled. Most spraying should be done when the air is still and the temperatures are above 65° and below 85°F.

## Dusting vs spraying

Dusters are lighter and much easier to handle than most sprayers. However, dusts do not give the uniform coverage of a wet spray and often drift excessively when being applied. When possible, use a wet spray; or when dusting, apply when the foliage is wet and winds are negligible. Dusts should be used only on small plants such as roses, annuals and perennials. They are not suitable for treating large trees or shrubs. Spraying is generally more effective than dusting.

## Be careful!

All pesticides are poisonous in varying degrees to man, animals and wildlife. The chemicals recommended in this bulletin represent those which are safest for you to apply and, if used properly, should not prove detrimental to wildlife or the environment.

*It is essential to follow the directions on the container and it is the responsibility of every homeowner to understand and observe these precautions.*

*It is recommended that every operator should wear a respirator and rubber gloves when he is working with pesticides. None of these materials should be used without great care. Wash your hands and face thoroughly after each time you spray.*

## Follow directions carefully

Be sure your sprayer is clean before it is filled with a spray mixture. Rinse it with water and pump water through the nozzles.

Use separate equipment to apply hormone-type herbicides and separate equipment to apply pesticides to avoid accidental injury to susceptible plants. Be careful not to come in contact with any of the spray or the mist or drift of the spray.

Try to mix the exact amount of spray you intend to use. Most chemicals can be used for some time after they have been mixed. However, it is best to mix a fresh mixture each time you are to apply it.

Dump excess mixed sprays into a hole in the ground at least 18 inches deep and cover it with soil.

**DO NOT DUMP EXCESS SPRAY MATERIAL INTO SEWERS OR DRAINS OR DISPOSE OF THEM IN SOIL TO BE USED FOR GROWING EDIBLE PLANTS.** Store all pesticides in a locked, well ventilated cabinet.

Dispose of empty pesticide containers in trash or by burying or burning them; avoid inhaling the smoke. Wash your hands thoroughly as soon as you have finished spraying. If you suspect accidental poisoning, call a physician immediately. Avoid getting chemicals on the body or on clothing. Remove contaminated clothing and wash yourself and your clothing thoroughly.

## All purpose spray

An all purpose spray purchased under a brand name and used according to the directions on the package is effective. However, specific treatment for each pest is most efficient.

**ALL PURPOSE SPRAYS APPLIED IN A PREVENTIVE MANNER ARE USUALLY LESS EFFECTIVE AND MAY LEAD TO PLANT INJURY.**

The number of sprays applied can be reduced drastically by proper diagnosis of the problem and the use of one well timed spray.

Most all-purpose sprays are prepared and labelled specifically for roses and other ornamentals, trees and shrubs, or fruits or vegetables. If you use an all-purpose spray, read the label carefully to learn what plants it can be used upon. This is particularly important when using systemic insecticides which can injure plants when applied repeatedly or excessively.

If you have more than the average sized home grounds, it may be more economical to mix your own all purpose spray as follows:

#### IN 1 GALLON OF WATER

2 teaspoons 57% Malathion Emulsion  
*plus*

2 tablespoons 50% methoxychlor  
wetable powder

OR

2 tablespoons 50% Sevin  
wetable powder

*plus*

2 tablespoons 50% Captan

#### IN 100 GALLONS OF WATER

1½ pints 57% Malathion Emulsion  
*plus*

2 pounds 50% methoxychlor  
wetable powder

OR

2 pounds 50% Sevin  
wetable powder

*plus*

2 pounds 50% Captan

#### Mix the spray

Before putting the mixture into the sprayer, mix it in a few quarts of water in a pail making sure that all of it is completely dissolved. Ordinarily sprays for insects are sold separately from sprays for diseases. It is wise to mix both of these in the pail before pouring them into the sprayer. Never use more of the spray chemical than is recommended in the directions. Partly fill the sprayer, pour in the mixture, fill the sprayer to the fill mark with water and keep it agitated during the time it is being used. This is also helpful if you are using a sprayer attached to the garden hose.

**NOTE:**— When mixing less than 100 gallons of spray, use the following rules of thumb:

1. One tablespoon of a wettable powder pesticide in 1 gallon of water is equivalent to 1 pound of wettable powder in 100 gallons of water.

2. One teaspoon of an emulsion (liquid pesticide) in 1 gallon of water is equivalent to 1 pint of an emulsion in 100 gallons of water.

#### Spray thoroughly

Ornamental plants are rarely over-sprayed. It is necessary to wet all of the branches and leaves on both sides with the spray. Spraying too sparingly is uneconomical, yet high concentrations of some materials can cause burning of the leaves. Read the directions carefully and use the recommended concentrations. Do not stand too close to the plant when it is being sprayed. Don't spray after the spray has begun to run off the plant. Enough is enough!

*Trade names are used in the table on pages 34 and 35 solely for the purpose of providing specific information. This is in no way a guarantee or warranty of the products, nor does it signify that they are approved to the exclusion of other products of suitable composition.*

#### Sprayers

Sprayers will range in type from those that are attached to the garden hose, those that have compressed air for pressure, and those that are power driven and produce higher pressures. On small home grounds a 2½ to 15 gallon sprayer is usually satisfactory. Small power driven sprayers of 15 to 30 gallon capacity with pumps that deliver 2 to 4 gallons per minute at 200 to 400 pounds pressure would be necessary for the home owner who has half an acre of land and several large trees. Consult your county agricultural agent or nearest spray equipment dealer for further information about your requirements.

#### Spray roses more often

On roses it is recommended that spraying be done every week. Think of spraying as a preventive measure to control insects and diseases before serious injury has developed.

#### Dutch elm disease

The first indication of injury of Dutch elm disease is the wilting of the leaves, particularly the new growth on a few branches. This disease is caused by a fungus that is introduced into healthy trees by a tiny brown bark beetle. Beetles usually breed under the bark of dead or dying trees or parts, such as fallen branches, trunks or logs.

Elm trees that are dying from Dutch elm disease should be cut down and burned. If the trees are large and any part of them wilts and does not revive, this part should be removed and burned. If the disease continues it will be necessary to remove the whole tree to help prevent the breeding of the beetle and the spreading of the Dutch elm fungus disease.

Valuable elms can be protected against beetle feeding with a methoxychlor spray. Since most elms require large equipment to spray them, you should contact a licensed spray applicator.




## Diagnosing pest troubles



PEST	PLANT	MATERIALS per 100 gallons water	TIME
ANTHRACNOSE	Oak, Sycamore, Walnut, Butternut, Hickory, Maple	2 pounds 76% Ferbam	When leaves are unfolding; again when leaves are half grown; and when leaves are full grown.
APHIDS black rosy green	Crabapples, Corylus, Barberry, Elm, Lonicera, Alder, Viburnum, Euonymus, etc.	1½ pints 57% Malathion emulsion or 1 pint 25% Diazinon emulsion	When aphid colonies appear on the new leaves and shoots — usually starting during late May.
APHIDS Spruce gall	All spruce	1½ pounds 25% Lindane or 1½ pints 57% Malathion emulsion	Hand-picking galls during early summer and destroying them is effective in controlling this insect on small trees. On large trees apply a chemical spray before plant growth begins in the spring — during April.
BEETLES Japanese	Crabapples, Linden Elm, Horse Chestnut, etc.	2 pounds 50% Sevin wettable powder	When beetles appear, about July 1; and repeat again in 10 days. It may be necessary to treat sod in sandy areas (see Grubs).
BEETLES Leaf Rose Chafer, etc.	Maple, Willow, Oak, Poplar, Clematis, Grape, Hydrangea, Rose	2 pounds 50% Sevin wettable powder	When small worms appear, about June 1, or other times.
BLACK SPOT	Rose	1½ pounds Phaltan or Folpet 50% wettable powder	Apply once a week before rain, or often enough to cover new growth.
BLISTER RUST	White Pine	Remove black currant for radius of 1 mile; other currants 900 feet	Any time of year when found.
BORERS	Mountain Ash, Crabapple, Dogwood, Pine, Spruce, Birch, Linden	4 pounds 50% methoxychlor wettable powder	Paint or spray on trunks and/or main branches (½" plus), when adults appear; and twice again at 2 week intervals.
CANKER WORM	Most deciduous shade trees	2 pounds 25% Malathion or 2 pounds 50% Sevin	Mid-May.
CEDAR-APPLE RUST	Crabapple, Hawthorn, Quince, Juniper (Red Cedar)	1½-2 pounds 76% Ferbam Acti-dione (as recommended on package)	Eliminate Red Cedar within 1 mile; four applications on Crabapple, etc. weekly, beginning about April 25. When orange masses appear on cedar galls; or eliminate Crabapple, Apple, Hawthorn, Quince, within 1 mile.
FIREBLIGHT	Crabapple, Cotoneaster, Pear, Hawthorn, Pyracantha, Quince	2-6-100 Bordeaux, or Streptomycin (as recommended on package)	When 25 percent of blooms open; again when 75 percent of blooms open.
GRUBS (in soil) Japanese beetle White grubs European chafer	Any soil, conifers, turf	2½ lbs. 5% Chlordane per 1,000 sq. ft.	Before planting on turf early spring or fall. Do not exceed one application per year. Treatment is effective for 4-5 years.
LEAF BLOTCH	Horse Chestnut, Witch Hazel	2 pounds 76% Ferbam	Three applications at 2-week intervals after buds open.
LEAFHOPPERS — PLANT BUGS	Flowering Cherry, Apple, Grape, Plum, Viburnum and Honey Locust	1½ pints 57% Malathion emulsion or 2 pounds 50% Sevin wettable powder	General application to control injury due to the feeding of these pests. With repeated treatments include a miticide.
LEAF MINER	Birch, Arborvitae, Lilac, Elm, Alder	1½ pints 57% Malathion emulsion or 2 pounds 50% Sevin or 1 pint 25% Diazinon emulsion	Mid-May; again mid-June; again late summer, spray tree and soil under the tree.

PEST	PLANT	MATERIALS per 100 gallons water	TIME
LEAF SPOT	Lonicera, Cornus, Cotton- easter, Kerria, Philadel- phus, etc.	2 pounds Captan 50% wet- table powder, or Zineb 80%	2-week intervals; through July and August.
MAPLE BLADDER GALL	Leaves of silver and red maple	2 pounds 50% Sevin wet- table powder or 1½ pints Malathion emulsion	In the spring as the buds begin to open or in the fall after all leaves have fallen.
MILDEW	Lilac, Rose, Phlox, Privet, Cornus, Euonymus, Hy- drangea, etc.	2 pounds wettable sulfur 95% WP or 4 ounces Kara- thane or Acti-dione (as recommended on package)	Once a week through July and Au- gust.
RED SPIDER (Mite)	Oak, Maple, Locust, Box, Rose, Spruce, Juniper, Ar- borvitae, etc.	Kelthane, and/or Tedion for mite eggs (as recommended on package)	Late May before injury; repeat ev- ery 2 weeks or if injury is severe, use miticide alone or include ovicide with miticide.
ROSE CHAFER	Apple, Blackberry, Cherry, Elder, Elm, Hydrangea, Peach, Pear, Peony, Rose	2 pounds 25% Malathion or 2 pounds 50% Sevin	When beetles are present.
SAWFLIES	Pines, Mountain Ash	1½ pints 57% Malathion emulsion of 2 pounds 50% Sevin wettable powder	Mid-May, or when worms appear.
SCAB apple	Hawthorn, Pyracantha, Cotoneaster	2 pounds Ferbam 70% WP	3 or 4 applications at 10 day inter- vals beginning when buds open.
SCALES (crawlers of) Oyster shell Euonymus Cotoneaster San Jose Lecanium and Cottony scales	Lilac, Poplar, Pachysan- dra, Elm, Pine, Quince, Snowberry, Taxus, Jun- ipers, Arborvitae, Cotton- easter, Rhododendron, etc.	1½ pints 57% Malathion emulsion or 2 pounds 50% Diazinon emulsion or 2 pounds 50% Sevin	For Euonymus, oystershell, San Jose scales — late May early June. For Lecanium, cottony maple and other soft scale — early July. Repeat treatment in 7-10 days.
SHOOT BLIGHT Tip blight Needle cost	Pine, Junipers	2-6-100 Bordeaux	When new growth begins; and at 10-day intervals while new growth develops.
SHOOT MOTH	All pines	4 pounds 50% Sevin wet- table powder	July 1, and again mid-July.
SOIL INSECTS Ants Wire worms	Any soil	2½ pounds 5% granular Chlordane/1,000 sq. ft.	Whenever present, not oftener than once a year. Work and water into soil.
TAR LEAF SPOT	Maple	2 pounds 76% Ferbam	3 applications at 10-day intervals be- ginning when buds open.
TARNISHED PLANT BUGS	Maple, Willow, Oak, Pop- lar, Clematis, Rose, Grape, Hydrangea	2 pounds 50% Sevin wet- table powder or 1 pint 25% Diazinon emulsion or 1½ pints 57% Malathion	Spray when bugs are seen.
TENT CATERPILLARS and FALL WEBWORM	Cherry, Apple, Birch and most deciduous shade trees	2 pounds 50% Sevin wet- table powder or 1½ pints 57% Malathion emulsion	Mid-May or when tents are first noted.
THRIPS	Roses, Gladiolus, Iris	1½ pints 57% Malathion emulsion or 1 pint 25% Dia- zinon emulsion	Begin in May and continue treat- ing to keep new growth covered.
WEBWORM	Juniper, Barberry, Elm, Oak, Maple, Willow, Pop- lar,	2 pounds 50% Sevin wet- table powder	During early May or in October.
TAXUS WEEVIL	Taxus, Hemlock, Retino- spora, other evergreens	2 pounds 50% Sevin wet- table powder	Apply the last week of June and re- peat in 7-10 days. Thoroughly treat plant and soil beneath it.
WORMS striped Oak and Maple	Most deciduous shade trees	2 pounds 25% Malathion or 2 pounds 50% Sevin wet- table powder	When first worms appear, about June 1.



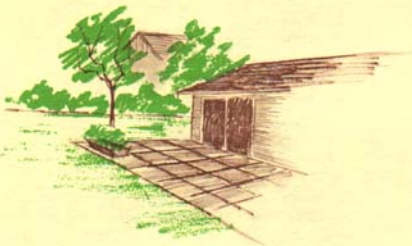
*Trees used to frame house that is set far back from the street.*

## Plan for Change

If YOUR PRESENT SURROUNDINGS do not exactly suit you, plan some changes. Obtain some cross section paper with one-inch squares divided into 100 small squares and make a bird's-eye-view picture of your property. Using one inch to represent 10 feet, each small square equalling one square foot ( $8\frac{1}{2} \times 11$  inch paper will handle an 80 x 100 foot lot, or 16 x 21 inch pages a large area), outline the house (include the roof overhang) showing the windows, doors, walks, drives, and any underground structures like a septic tank, an oil tank, etc. Mark the property line, the distance you are from the street, the width of the sidewalk, and orient it to the north as you would on a map. Add any existing trees, shrubs, other buildings or flower borders. Then let your imagination locate a future patio, swimming pool, play area, vegetable garden, or any other features.

### Keep it simple

In developing a landscape, keep it as simple as possible. By using a smaller variety of plants, the final result can be simple and dignified. Large, open lawn areas with informal groupings of shade trees and simple compositions of shrubs along the borders enhance the appearance of the house. Too much planting requires too much maintenance and may result in a cluttered effect.



*A combination of small trees and shrubs to provide a screen for privacy.*

### Plan for low maintenance

A successful landscape planting requires a minimum of maintenance. By careful selection of mature sized plants and a good spraying and pruning program, work can be reduced considerably. Costs can also be cut by planting in good soil with satisfactory drainage, removing dead, diseased and weak growth, and following a pre-designed plan as described.

### Plant for a purpose

No home grounds is complete without trees. Arrange them informally where they will make shadows where they are needed. Seldom place large trees



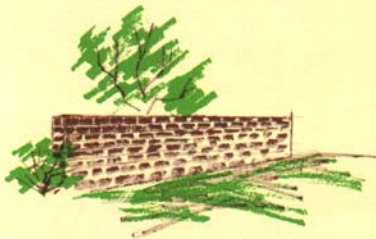
*Trees used as background for the house effective in softening the lines.*

closer than 20 feet to a house; use some behind the house as a background for the building. Use trees and shrubs to screen out unsightly areas.

Provide privacy by planting enclosures and arranging these as you would rooms in your house. In suburban areas where houses are located close to one another, this privacy is more important than in areas that are less congested. Houses rarely need to have a foundation planting surrounding the whole house. Use plants to frame the building or parts of it, to subdue or hide certain parts, or to soften long monotonous wall surfaces.

Shrubs can be contained within bounds for a certain number of years, but sooner or later (and this is rarely more than 15 years) most plants need replacing or rejuvenation.

If a fence is essential to serve as a screen or barrier, select one that is useful, yet blends with the style of the house or other features on the property. A fence with spaces between the boards, as woven slats or bamboo stems, gives the effect of screening and can make as good a background for plants.



*Graceful flowering trees and shrubs for special accents to a wall.*

### Functional drives

Be sure that your driveway is 14 feet wide to accommodate one car, or 20 feet wide to accommodate two cars. Make it as straight as possible and directly from the street to the service side of the house. Avoid turns and corners unless they are necessary to get access to a turning space or to the garage. Unless for convenience it seems necessary to have access to both sides of the house, do not have a circular driveway.

### Functional sidewalks

If the house is close to the street, place the sidewalk directly from the main entrance to the street and be sure that it is 4 or more feet in width. Connect the main entrance to the house with the driveway. Remember in designing walks and driveways to plan them for the peak load rather than just for daily use. Use a minimum of 4 feet wide and add 2 feet for each additional person.

When there is a change in the level, build steps for their function first, then for their beauty. Curved walks can be less monotonous than long, straight walks, but they should have a purpose for curving. For comfortable walking, the risers in steps should not be more than 6 inches high and all risers should be the same for each step. Usually it is more attractive to build the steps flush with the contour of the land and of the same material of which the walk is constructed. Concrete is durable. Flagstone, bricks, or concrete squares are attractive in naturalistic surroundings.

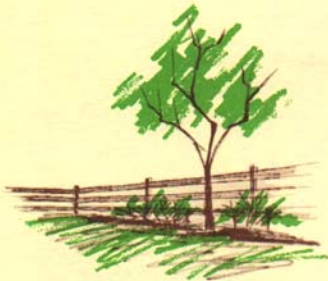
### Focus on the house

It is rarely necessary to have a foundation planting that is continuous along the front of the house. A few well grown specimens are far more effective. One plant on each side of the entrance will make the front





*Small tree used to break the horizontal line fence.*



*Trees and shrubs to make an architectural feature more attractive. Shrubs and a tree to soften the effect of a fence.*



*On houses where the foundation protrudes out of the soil, a continuous planting may be necessary to cover the concrete or cinder blocks and create the illusion that the facing of the house goes right down to the ground.*

door a focal point of the foundation planting. These two plants will provide balance if of similar size and bulk but of two different shapes. Usually another plant is needed at each front corner of the building to conceal the vertical lines of the house and blend it into its natural surroundings. Low growing flowers or ground covers may be planted to connect these 4 plants.

### Outdoor living

Be sure your area for outdoor living is sheltered and has privacy, convenient access to the kitchen or living room, and has shade from a tree, a wall, a hedge, a canopy, or a large umbrella. If an outdoor living area is to be used frequently, it must be paved because grass will not grow where there is heavy

traffic. Brick, flagstone, concrete, concrete blocks, or field stone make good paving and dry quickly after a shower.

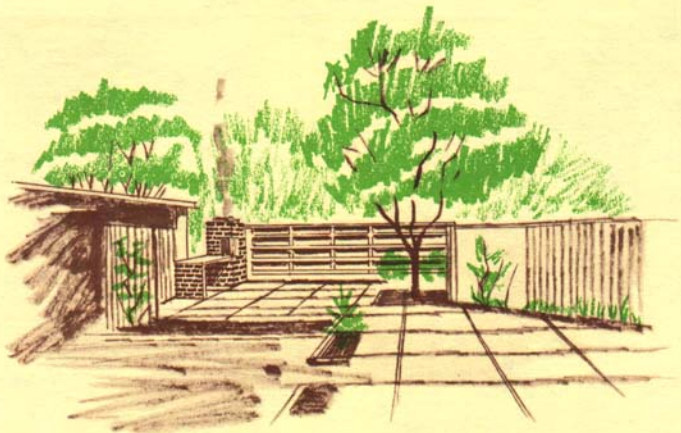
You might wish to have a simple flower garden that is convenient to the patio, or a place where you can grow some fresh vegetables. Use flower colors that will blend with the color of your furniture or umbrella. Potted plants or shrubs in ornamental containers are often effective. Some well located outdoor electric sockets for use in lighting or for a barbecue are convenient. If you are building a new house, outdoor lighting can be part of the plan and an underground cable can run to various central locations in the garden.

### Keep it simple

The most beautiful home grounds are those that are blended naturally into the surroundings—those that make the most effective use of the cubic space immediately around the house and at the same time provide good transition into the surrounding areas.

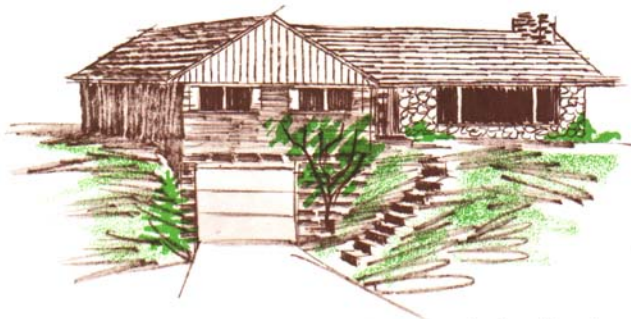
Regardless of the location, the land immediately around the house must be graded so that it will be left in its most functional form. Unless the plantings are carefully planned and the plants selected for functional locations, the home grounds will not be attractive or usable.

Locate the shrubs, and the trees according to their size and height. Stagger the plants so that their trunks will not be in the front of one another. In open areas, group plants of at least three of one type together. The use of your plants may be informal or natural, using free-flowing curves which give a feeling of freedom, relaxation and spaciousness. To use the space effectively consider the views from the windows and views over and beyond your property line. Consider methods of opening up vistas and an opportunity to provide third dimensional effects.



*Suggestion for an elaborate outdoor fireplace, in this contemporary outdoor living area.  
Or it may be a more simple restful area such as a small pool.*





*On large blank walls or in areas where shrubs and trees cannot be effectively used on slopes, a vine can complete the design and be most effective.*

### Consult a professional

Development of your home grounds landscape is not simply planting a shade tree in one place and a few evergreens in another. It is a long term project whereby the space is most adequately arranged for convenience, function, and enjoyment. No matter how small an area you are considering, the advice of a landscape architect or landscape nurseryman is invariably worthwhile.

### Use your imagination

Before you approach a professional for his assistance, make a thorough study of your present home grounds situation. Make a rough layout on paper. Then start to plan. Consider several alternatives for flower borders, terraces and walks and for anything that you would wish to have included. It is easy to

move the trees and shrubs around on paper. And so much better to make your plans for the whole area at one time, remembering that for financial reasons you may not wish to develop it all at once, but rather over a period of several years.

Remember that a landscape planting of any home grounds is an ever changing picture. Even if you do a small section at a time, the existing plants will grow, develop and may need to be pruned, moved or in some way altered.

To get the most out of your home landscaping, always keep the following guide lines in mind:

1. Feature what you prefer.
2. Select your plants carefully.
3. Make it easy on yourself.
4. Enjoy yourself.
5. Work from overall plan.



*Spaced foundation plants.*

## Other publications

The following publications of the Michigan State University Cooperative Extension Service are available at County Extension Offices throughout Michigan. They may also be obtained or purchased at the MSU Bulletin Office, P.O. Box 231, East Lansing.

- E-426 Ornamental Evergreens (20¢)
- E-491 Landscape Planning for Rural Homes (15¢)
- E-492 Ornamental Vines for Michigan Homes (15¢)
- E-494 Outdoor Lighting for Home Grounds (15¢)
- E-498 How to Take Accurate Soil Samples
- E-534 Controlling Pests of Trees and Shrubs
- E-549 Landscape Planning for Residential Properties (15¢)
- E-552 Ornamental Deciduous Trees (15¢)
- F-238 Protecting Trees and Shrubs from Construction Damage
- E-653 Lawn Weed Control
- F-281 Pruning Deciduous Shrubs and Woody Vines
- E-691 Paving for Home Grounds (15¢)

### U.S. Government Publications

- Superintendent of Documents
- U.S. Government Printing Office
- Washington 25, D.C. (price 5 cents)
- Leaflet No. 439 Spring Flowering Bulbs
- G-25 Roses for the Home

This revision was edited by Harold Davidson, Department of Horticulture, Michigan State University. The original edition was edited by Donald P. Watson, now at the University of Hawaii, who also wrote parts of this bulletin.