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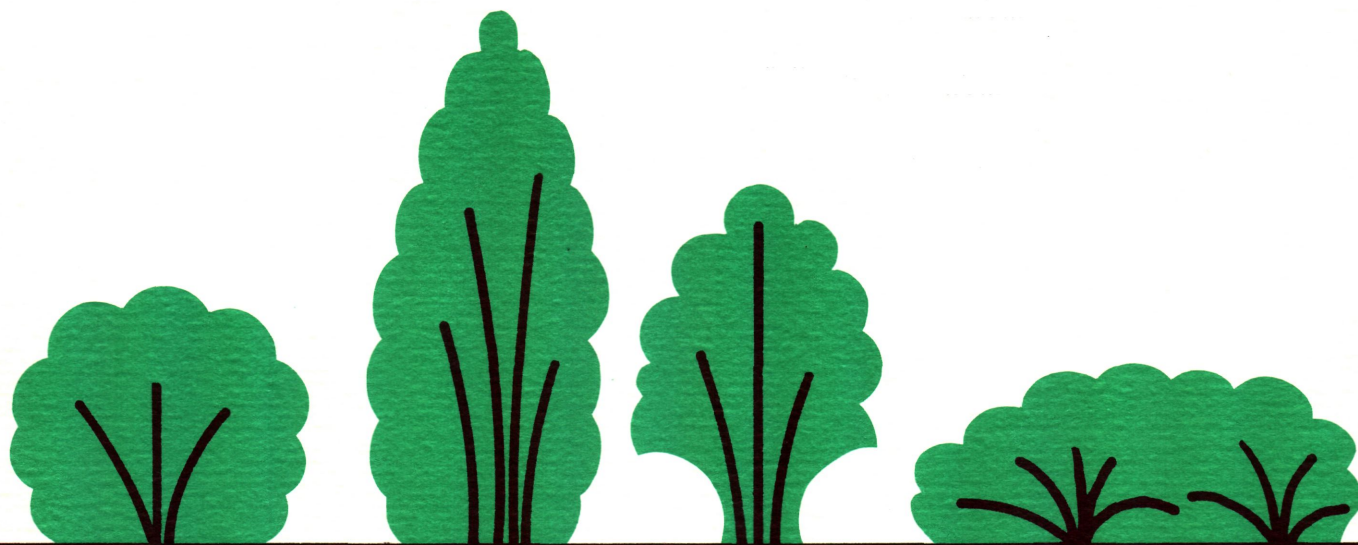
A Gardener's Guide to Shrubs
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Cooperative Extension Service
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August 1986
54 pages

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A GARDENER'S GUIDE TO SHRUBS

Cooperative Extension Service
Michigan State University
Extension Bulletin E-1818 (New) August 1986



A GARDENER'S GUIDE TO SHRUBS

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SELECTING SHRUBS

Shrubs have many uses. They can be used to direct traffic, to accent corners, and to form hedges and screens. Properly selected, a shrub grows and performs its intended function with a minimum of maintenance. Shrubs used improperly are a source of landscape problems.

The best use for a particular shrub is determined by its growth habit, size, ornamental characteristics, spread, ease of growing and site requirements. The best shrub for a particular use depends on the site characteristics and the desired landscape effect. Shrubs fill in between the short lawn and tall trees. They may be used as a background for other plants. You can fill either large or small spaces with properly selected shrubs.

A particular shrub may have a number of cultivars. These were selected because they have a trait the species doesn't have, such as unusual growth habit or flower, bark, fruit or foliage color. The cultivar may have been selected because it is different, not because it is better. In many cases, however, it will be better. Lilac is an example of a plant with many cultivars. There are hundreds of cultivars but fewer than 10 distinct flower colors. Many cultivars have virtually identical flower color but differ in other traits, such as presence of single or double flowers, panicle length or mildew resistance.

Buy shrubs to obtain the most ornamental display for the money invested. For instance, forsythia and lilac are beautiful in blossom but add little to the landscape the rest of the year. Perhaps another shrub, such as a viburnum, would provide flowers, fall color and fruit. Mix shrubs according to blooming times so you can have something in bloom throughout the spring and summer. Avoid shrubs with insect or disease problems.

Landscapes can quickly become jungles when shrubs are overplanted. Each shrub in a planting should have enough room to develop into a well formed plant at maturity. When a planting is young, spacings may appear too wide and the plants look sparse. As the shrubs grow, the spaces fill in and the planting appears as one mass. Closely planted shrubs have no opportunity to

develop their characteristic form. Plants with attractive growth habits will not display that ornamental trait if crowded. Pruning is not a substitute for planning and proper spacing. A large shrub maintained in a small space by pruning will not look good.

USES OF SHRUBS

Shrubs suitable for planting on banks or slopes have suckering root systems or branches that root where they touch the ground. Use shrubs tolerant of adverse growing conditions.

A number of shrubs grow and bloom in shade. These shrubs don't require shade—they simply adapt to it better than other shrubs. Many shade-tolerant shrubs grow better when given more light.

Shrubs—especially those with thorns—can be used as a barrier to unwanted foot traffic. But consider the possibility of injury resulting from the use of thorned plants. Always consider future possibilities when selecting a shrub. Pruning, maintaining or removing a planting of thorned shrubs is difficult. An armed barrier plant should not be invasive. Species of rose are used effectively as barrier plants, but they spread rapidly and are difficult to get rid of.

Hedges or screens of shrubs provide privacy. A hedge is clipped or sheared to keep it at some definite width and height. A screen grows to whatever height and width is normal for the plants making up the screen.

Shrubs in screens should have a dense branching habit. Avoid those with a tendency to form large thickets of suckers. When shrubs lose the bottom branches, cut the plants off within a few inches of the ground to rejuvenate the screen. Screens tend to look more natural and require less maintenance than hedges.

Hedges provide privacy and create a thick barrier, but they have a high maintenance requirement. Some hedges need shearing two to four times a year to maintain a manicured appearance. A hedge gains 1 to 2 inches of growth at every shearing. Hedges are sheared to be wider at the bottom to prevent the bottom of the hedge from becoming bare of foliage. Most deciduous hedges

are rejuvenated by cutting them back to within a few inches of the ground. Shrubs selected for a hedge must be tolerant of shearing.

Here are the steps to follow when starting a hedge with young plants of deciduous shrubs. At planting, cut the plants to within 2 to 4 inches of the ground; then allow them to grow. The spacing of plants in a hedge depends on the plant used. Clip new growth two to three times during the growing season to shape the hedge. Once the hedge shape is established, fewer shearings are needed. Use string stretched along the hedge at the desired height as a shearing guide to maintain a uniform height. Do not shear the hedge after late summer when the plants are getting prepared for winter.

Shrubs direct traffic around property corners by keeping pedestrians on the sidewalk. Plantings in the front yard should not block drivers' views of the street when cars are leaving the driveway.

Trees growing close together may create a mowing problem. A planting of shade-tolerant shrubs around the trees eliminates the need to mow around the trees, making mowing easier and protecting the trees from lawn mower injury. This type of planting ties the trees together in one mass and works best when the trees are fairly close together.

A foundation planting need not consist of a solid row of shrubs—a few carefully selected and placed shrubs can be more effective. Finding a shrub that will fit in the space allotted to it at maturity should not be difficult.

A number of shrubs can be used as ground covers. Like other ground covers, they should be adapted to conditions found in the growing area.

ORNAMENTAL CHARACTERISTICS OF SHRUBS

The time any shrub remains in bloom varies from a few days to several weeks. The sequence of bloom of several types of shrubs remains the same, so you can use the sequence of bloom to develop a planting with a long blooming period. Weather can shorten the blooming sequence so that all shrubs bloom within a shorter time period. Most landscapes have lots of flowers in spring, few in summer.

Some shrubs bloom on wood produced during the current growing season. The other type of shrub forms a shoot in the spring, lengthens it in summer, then forms flower buds during the fall. It carries these flower buds through winter and flowers in the spring. A spring-blooming shrub is pruned right after flowering.

A summer-flowering shrub, blooming on the current year's wood, produces more new growth—and therefore more flowers—if it's pruned in early spring.

Cold temperatures can kill flower buds carried through the winter. A shrub fertilized heavily with nitrogen may not flower well. Nitrogen promotes the formation of leaves and branches but not flowers.

There is a sequence of fruiting just as there is a sequence of blooming. The fruiting sequence is not the same as the blooming sequence and may be disrupted by birds feeding on the fruit. Shrubs with showy flowers may have insignificant or non-ornamental fruits. Shrubs with inconspicuous flowers may have very showy fruits.

The same factors that prevent flowers prevent fruiting. Lack of pollination because of cold, rainy weather during full bloom that prevents bees from flying may also prevent fruiting. Frost that kills the blossoms also results in failure to set fruit.

Some shrubs, such as holly, yew and bittersweet, are dioecious—that is, the male and female flowers occur on separate plants, so each plant is either male or female. Fruit is produced only on female plants. To ensure pollination, a male plant must be grown nearby. Usually one male plant pollinates two or three female plants.

On some plants, flowers are either female or male but both occur on the same plant. Plants with this flowering habit are monoecious. Most flowering shrubs have flowers with both female and male parts.

Brightly colored fruits make a better show than dull colored ones. A number of shrubs have black or dark purple fruit that often go unnoticed.

The season of the year in which fruit is ornamental should be a consideration. Fruit that per-

sists into winter provides color in the winter landscape.

A shrub that produces beautiful fruits but too few of them to be noticed has limited ornamental value.

Within limits, the larger the fruits, the more ornamental they are. Large fruits can be a problem to clean up, however, and make a mess where they drop onto walks and driveways.

Some shrubs bear poisonous fruits. These should not be planted near public walkways.

Some shrubs produce fruits eaten by birds. This may be a reason for selecting a particular shrub.

Foliage color other than green can occur in fall, in spring, or from spring to fall. Spring-only foliage color fades to green or off-green by summer. Colored foliage shrubs can be less vigorous than the same plant with green foliage. Shrubs with variegated leaves may not be as vigorous as the same species with green leaves. Shrubs with colored foliage may need different light intensity.

Sunlight is necessary for good fall color development or summer foliage coloration. For example, barberry cultivars that have purple leaves when grown in the sun have green leaves in the shade. Winter color is provided by evergreens or shrubs with colored bark or persistent fruits.

The two types of evergreens are needled and broadleaved. Needled evergreens are useful as background plants, and some broadleaved evergreens are exceptional flowering plants.

Bark is another ornamental feature. The bark may be highly colored or have interesting texture.

Select shrubs hardy enough to survive a normal winter.

Avoid shrubs with serious pest problems. The large selection of shrubs available makes it unnecessary to use those with serious pest problems. Most shrubs are attacked by pests during their lives, but most of these can be easily controlled or ignored. Avoid shrubs with serious pest problems every year.

PRUNING SHRUBS

Determine if a flowering shrub blooms on current or last year's wood before pruning it. When

possible, let shrubs develop into their characteristic form and size. Maintaining shrubs in unnatural shapes increases the care required by the plants.

First, take out dead stems as close to the ground as possible. Stems not originating at ground level are cut off where they join a healthy branch. Next, take out any diseased or cankered stems. Stand back and look at the shrub. If two branches cross, remove the weaker one. Branches low to the ground or those that interfere with lawn mowing are removed next. If the plant shape is satisfactory, the pruning is then done. Branches sticking up too high may be removed. To rejuvenate old shrubs, take out one-third of the old stems each year for three years. When a shrub has few stems, leave a new shoot to replace the old stem removed. Remove suckers not needed to replace older stems.

Deciduous shrubs that have grown too large can be cut back to the ground. This works for screens or hedges that are full of dead wood or greatly overgrown. Evergreens cannot be cut back this severely.

Pruning and shearing are not the same. Pruning involves the removal of individual branches or stems. Shearing involves clipping or shaping by cutting off the twig tips. Long-bladed hedge shears are used on hedges or other sheared plants.

Avoid repeatedly cutting off the top of a shrub. The plant sprouts just below the cut, giving a stem with a bunch of branches on top. If continual topping is necessary, the plant is the wrong choice for that site.

CULTURAL PROBLEMS

Evergreen shrubs winter-burn when planted on the south or southwest side of a house. Winter burn can be prevented by shading the shrub with a screen of burlap or other material. You can also lean discarded Christmas trees against a wire running parallel with the shrubs to provide shade. Injury occurs when the sun warms up the foliage so it is many degrees warmer than the air. The foliage thaws out and may be killed when it cools rapidly to air temperature when the sun sets or the plant is shaded. Thawed plants can dry out

because the foliage loses moisture that roots in frozen soil cannot replace.

Salt used on sidewalks or streets can enter the root zone and settle onto the foliage of evergreen shrubs. Rain washes the salt below the shrub root zone, so injury from salt in the soil is more severe in dry springs. Cars driving on salted roads throw up a salty spray that drifts to nearby shrubs. Screens of tar-backed burlap protect low shrubs growing near roads. Snow containing salt can be shoveled onto shrubs from walks or porches. Repeated contact with salt can kill bud tissue, causing shrubs to appear twiggy and stunted.

RODENT INJURY ON SHRUBS

Rabbits and mice feed on shrub bark in winter when little other food is available. Some shrubs, such as burning bush, are favorites. Multi-stemmed shrubs are difficult to protect with hardware cloth cages or other physical barriers. Rodent repellents may be used according to label directions but must be applied before snowfall. How well a shrub recovers from feeding injury depends on the extent of the injury.

ERICACEOUS SHRUBS

Ericaceous shrubs require an acid soil. This group includes azalea, rhododendron, pieris and most of the flowering broadleaved evergreens. If the soil is not sufficiently acid, the plants are unable to absorb iron. Symptoms of iron deficiency are yellow leaves with green veins. When the deficiency is severe, the leaves are yellow with brown margins. The symptoms can be quickly but temporarily alleviated by spraying the plant with iron chelates. Acidifying the soil by applying sulfur or aluminum sulfate to the soil is a better solution. If soils are not naturally acid, it's better to use other plants rather than try to change the soil pH.

PEST CONTROL

Pests most commonly seen on a shrub are listed in the section of the plant list devoted to that species.

Healthy plants are more able to tolerate minor pest problems, such as periodic defoliation by leafspots or leaf-eating insects.

Inspect shrubs regularly and thoroughly to detect pests before they become serious. Most insect problems are easiest to control when the infestation is just started.

If pesticides must be used, read and follow all label directions and precautions. Not all formulations of all pesticides are labelled for all suggested uses. Buy a formulation with the desired use listed on the label.

GUIDE TO SHRUBS

Acanthopanax sieboldianus

Five-Fingered Aralia

Acanthopanax tolerates shade, dust, rocky soil and drought. Normally the branches are upright near the base and arching toward the tips. The plant may be sheared and has no particular soil preference. Acanthopanax holds its leaves well into fall, has a fibrous root system and transplants well. Acanthopanax spreads by suckering and can be used on slopes or in a screen. Mature plants are 5 to 10 feet tall and 4 to 6 feet wide. The growth rate is moderate.

Acanthopanax Insects

Four-lined plant bug causes brown, round spots on the leaves. The injury is easily tolerated by most plants. The insect is green with four black stripes and can be controlled with Sevin dust or sprays of malathion.

Acer palmatum

Japanese Maple

Japanese maple is grown for its colored leaves, interesting growth habit and fine leaf texture. This large shrub or small tree tends to leaf out early, so it may be injured by spring frosts. Variegated types are a bit more difficult to grow and are subject to sunburn. Protect them from drying winds and direct sun. Provide exposure to sun or partial shade and well drained, acid soil with plenty of organic matter. Japanese maple has a height and spread of 20 feet, but this varies with the cultivar. It grows slowly and is not very tolerant of pruning or transplanting.

There are many cultivars of Japanese maple with a wide variety of leaf shapes, growth habits and leaf coloration. Only a few reported to be hardy are listed: 'atropurpureum'—reddish leaves with

five lobes; 'Burgundy Lace'—reddish foliage and cut leaves; 'elegans'—leaves with rose-colored margins when they first unfold; 'ornatum'—foliage is cut and reddish.

Acer Diseases

Verticillium wilt causes wilting and death of a branch or part of the tree crown. Infected sapwood is stained dark or olive green, but this symptom can't always be found. If you can't find the staining, do not assume the problem is not verticillium wilt. Severely infected trees can't be saved. Fertilize lightly infected trees with high nitrogen fertilizer and prune affected branches. This treatment does not cure the problem but may allow the tree to outgrow the infection. Girdling roots cause symptoms that mimic verticillium wilt.

Scorch occurs during periods of high temperatures accompanied by wind and low rainfall. Trees with diseased, damaged or inadequate root systems also show scorching. Scorch symptoms are light brown, dead areas at the margins of the leaves. The symptoms may cover the entire tree or only the side exposed to sun and wind. Watering may help if dryness is the cause of scorching. Watering has no effect if the root system is inadequate or diseased.

Anthrachnose, caused by *Gloeosporium apocryptum*, is more of a problem in rainy seasons. The disease looks like scorch and the two may be confused. The light brown or tan areas on the leaves may run together, killing part of the leaf. Anthrachnose may be controlled with sprays of Zineb or a copper fungicide applied as the leaves open in spring. Two additional sprays at two-week intervals are needed. The disease is most common on sugar and silver maples. Other maples may not be affected as severely.

Acer Insects

Aphids suck plant juices, and heavy infestations deposit sticky honeydew on lower leaves. Aphids are controlled with sprays of diazinon, malathion, acephate or rotenone. The insects can also be dislodged with high pressure water spray from the garden hose.

Scales of various types are an occasional problem on maple. Cottony maple scale forms a cottony mass on the lower sides of branches. Scales are controlled with sprays timed to kill the crawler stage. For crawler control, use Sevin according to label directions.

Borers are an indication the tree is not growing well and may have additional problems. Controlling borers involves keeping trees healthy and identifying the borer infesting the tree. A thin wire pushed into the borer tunnel may kill the insect.

Aesculus pavia Damask Horse Chestnut

The main ornamental feature of damask horse chestnut is red flowers produced in panicles at the ends of the branches. This is a small tree or large shrub growing 20 feet tall and spreading to 25 feet. The fall color is yellowish but the leaves drop quickly. Provide a sunny exposure and a rich, damp soil. The root system is fibrous and suckering and the growth rate moderate. The nuts are covered with tan husks while still on the tree. The new foliage has a reddish tinge to it. Damask horse chestnut transplants well and may form clumps.

There are several cultivars: 'atrosanguinea'—flowers very dark red; 'humilis'—low, prostrate form; 'sublaciniata'—leaves deeply serrated.

Aesculus Diseases

Leaf blotch causes discolored and water-soaked areas on the leaves. These later turn light reddish brown with bright yellow margins. Entire leaves dry, turn brown and fall off. Leaf stalks may also be attacked. This disease looks very much like scorch. Rake up and destroy old leaves. The disease is caused by the fungus *Guignardia aesculi* (*Phyllosticta paviae*) and is controlled with dormant sprays of lime sulfur.

Leafspot diseases are caused by many other genera of fungi. Use sprays of copper sulfate. Dormant sprays of lime sulfur may also control leafspots.

Powdery mildews of several genera cover leaves with white mold. Use sprays of benomyl.

Anthracnose kills terminal shoots. The disease is caused by *Glomerella cingulata* and is also called leaf blight. No chemical control is listed. Prune out and destroy infected tissue.

Leaf scorch is a physiological problem. The leaf margins and eventually the entire leaf turns brown. The condition usually occurs in midsummer. Keep the plant well watered during dry weather.

Aesculus Insects

White-marked tussock moth is a fuzzy caterpillar with a yellow body, red head, black marks and four tufts of hair on its back. A few insects are not serious and their feeding will be tolerated by the tree. Use sprays of methoxychlor or *Bacillus thuringiensis* to control large numbers of the caterpillars.

Japanese beetle eats the leaves down to the main veins. Leaves at the top and on the south side of the plant are most often eaten, and attacks can be quite sudden. Japanese beetle can be controlled with sprays of Sevin. Applications of diazinon or milky spore disease will control Japanese beetle grubs in the lawn.

Berberis koreana Korean Barberry

Korean barberry is a dense, thorny plant useful for barrier plantings. It grows 6 feet high and spreads slightly less than that. It has good red fall foliage color and produces yellow flowers in 3- to 4-inch racemes in mid-May. The fruits are red and may persist into winter. Korean barberry suckers profusely and may become a nuisance.

No cultivars are listed.

Berberis thunbergii Japanese Barberry

Japanese barberry is thorny, so it's useful for barrier plantings. The plant tolerates most light exposures and soils, but purple-leaved cultivars turn green in shade. This shrub grows slowly but transplants easily. It grows 3 to 6 feet tall and spreads 4 to 7 feet. Japanese barberry can be sheared and used as a hedge plant. The main ornamental features are persistent red fruits and fall color in shades of red, orange and yellow. Some strains fruit more heavily than others. The plant produces yellow flowers, but these are not highly ornamental.

Several cultivars are listed: 'atropurpurea'—reddish foliage; 'atropurpurea erecta'—purple leaves, erect habit; 'atropurpurea Redbird'—better foliage color, leaves larger, more compact habit; 'aurea'—bright yellow leaves; 'Crimson Pygmy'—a dwarf 2 feet high and 3 feet across, with reddish foliage; 'Globe'—globe-shaped, broad; 'minor'—smaller leaves, fruit and flowers, rounded habit; 'Thornless'—no thorns; 'variegata'—leaves with spots of white, light gray and yellow.

Berberis Diseases

Bacterial leafspots are first small and dark green and appear water soaked. Later the spots turn purplish brown. Leaf stalks and new growth may also be attacked. Infection of older twigs results in dieback. Prune out and destroy infected twigs. Sprays of copper fungicide may take care of the problem.

Anthrachnose caused by *Gloeosporium berberidis* is sometimes listed as a leafspot. Symptoms are round, brown spots with reddish margins on the upper leaf surface. Another fungus, *Phyllosticta berberidis*, causes purple spots on the leaves. Copper fungicides may provide some control of these diseases.

Powdery mildews of different genera cause a white coating on the leaves. The disease can be controlled with benomyl or sulfur.

Verticillium wilt causes wilting and eventual death. Nothing can be done but to keep plants healthy by watering and fertilizing. Severely infected plants do not recover.

Berberis Insects

Aphids suck plant juices, and heavy infestations coat the leaves with sticky honeydew. Large aphid populations cause the new growth to be distorted. Use sprays of malathion, Sevin, acephate and rotenone. Aphids can also be dislodged by a high pressure water spray from the garden hose.

Scale insects blend in well with the stems and may not be readily noticed. Infestations can be controlled with dormant oil applied in the spring before growth begins. A less desirable alternative is applications of Sevin or acephate when crawlers are active. The preferred method of control involves regular inspection for early detection of the infestation, then spraying with dormant oil.

Callicarpa dichotoma Beautyberry

Beautyberry bears metallic, purple berries during October and November. The best growing area is one with sun and a light, rich, well drained soil. The plant grows 4 feet tall and needs a protected site. Pruning is done in winter or early spring. The clusters of small flowers are present in July and August.

Callicarpa Diseases

Leafspots may be occasionally seen and can be controlled with sprays of copper fungicide.

Callicarpa Insects

Aphids may occasionally be seen and can be controlled with sprays of malathion, or they may be dislodged by high pressure water sprays from the garden hose.

Calycanthus floridus Sweetshrub, Carolina Allspice, Strawberry Bush

Sweetshrub is more an oddity than an ornamental. The flowers are borne in midspring and have maroon to brown, straplike petals and a fragrance similar to that of strawberries. The leaves and fruits are aromatic when crushed. The plant grows in sun or shade but is taller in shade. Sweetshrub transplants easily and prefers a moist

soil. A height of 9 feet and spread of 12 feet can be expected. The growth rate is moderate.

Calycanthus Diseases

Bacterial crown gall causes warty-looking growths on the stems near the soil line. There is no practical control measure for this problem. Destroy infected plants and avoid planting in contaminated soil.

Powdery mildews of various genera cause a white coating on the leaves. Use sprays of benomyl or sulfur.

Campsis radicans

Trumpet Creeper, Trumpet Vine

Trumpet vine climbs to 30 feet or more when given support. The orange flowers are borne in summer and are often visited by hummingbirds. The invasive nature of the plant makes it hard to get rid of. Ants often live on trumpet vine and are sometimes found objectionable by gardeners.

There are several varieties: 'atropurpurea'—large, dark red flowers; 'speciosa'—bushy growth habit; 'flava'—yellow flowers; 'praecox'—blooms earlier.

Campsis Diseases

Leafspots caused by various genera of fungi may be seen but are not serious. No chemicals are listed.

Powdery mildew of various genera cause a white powdery growth on the leaves. Use sprays of benomyl or sulfur.

Campsis Insects

Planthoppers may occasionally feed on trumpet vine. The insects generally cause no serious damage, so controls are not needed.

Caragana arborescens

Pea Shrub, Pea Tree, Siberian Pea Shrub

Pea shrub is very hardy and useful in adverse situations. The plant's chief value is its ability to adapt to poor sites. On better sites, a more ornamental plant could be selected. The plant prefers a sunny exposure but tolerates partial shade. It is quite tolerant of soil type and grows in sand. Pea shrub grows rapidly and will reach

15 to 20 feet tall and spread 12 to 18 feet. The texture is moderately fine in summer but coarser in winter. Yellow flowers are produced in mid-May but are more or less hidden by the foliage. Pea shrub tolerates pruning.

Cultivars include: 'lorbergii'—the leaves are grasslike, flowers smaller; 'pendula'—drooping branches; 'pygmaea'—dwarf, about 2 feet high, rare.

Caragana Diseases

Bacterial hairy root causes the formation of clusters of roots on the lower stem. There is no chemical control for this problem.

Leaves can be blighted by fungi in the genera *Ascochyta* or *Septoria*. Infected leaves die. The disease is not common and chemical control is not needed.

Celastrus scandens

American Bittersweet

American bittersweet grows 20 feet tall and can girdle and kill live plants used for support. Both male and female vines must be grown if you want fruits.

Celastrus Diseases

Leafspots caused by several genera of fungi are usually not serious. Infected leaves can be collected and destroyed.

Various genera of powdery mildew cause a white coating on the leaves. Severe infections kill the leaves. Use sprays of benomyl or sulfur.

Crown gall caused by *Agrobacterium tumefaciens* causes formation of warty-looking galls on the vine trunks. There is no satisfactory control. Avoid planting in soil where the disease has been a problem.

Celastrus Insects

Euonymus scale causes leaf yellowing followed by plant death. The insects are not readily seen and so can build up to large numbers before they are noticed. Dormant oil controls scale and is less harmful to predators. Apply Sevin or malathion when crawlers are active. The preferred method of control involves regular inspection for early

detection of the infestation, then spraying with dormant oil.

Oystershell and San Jose scale may also infest bitersweet. Control with dormant oil applied in spring before growth starts. Oystershell scale crawlers are controlled by sprays of malathion or Sevin. Other scale crawlers are controlled by sprays of Sevin. The preferred method of control involves regularly inspecting plants for early detection of the infestation, then spraying with dormant oil.

Aphids suck plant juices, and heavy infestations distort new growth and cover the leaves with sticky honeydew. Use sprays of rotenone and malathion. The insects can be dislodged with a high pressure water spray from the garden hose.

Chaenomeles speciosa (lagenaria) Flowering Quince

Flowering quince has brightly colored flowers, and its spines make it useful as a barrier plant. The fruits are not ornamental but have a high pectin content and may be used for jelly. Most flowering quince grow 4 to 8 feet tall and spread 6 to 10 feet. Grow the plant in full sun in any soil. Transplanting is easy, but control suckers to prevent formation of a thicket. Flowering quince may be used as a hedge plant. Branches may be used in arrangements if they're cut before the flowers are fully expanded. The flower color depends on the cultivar grown.

Chaenomeles Diseases

Bacterial crown gall causes warty growths on the lower stems near the soil line. There is no chemical control. Destroy infected plants and avoid replanting in infected soil.

Fireblight causes the tips of the branches to die. Blighted leaves have a scorched appearance and hang on the twigs. There is no satisfactory chemical control. Prune off infected branches.

Leafspots caused by fungi in the genera *Fabraea* and *Cercospora* may result in leaf drop when the infection is severe. A disease caused by *Fabrea maculata* is also called leaf blight. A fruit spot caused by *Mycosphaerella pomi* can cause leaf blotch. The leafspots can be controlled with sprays of copper fungicide.

Chaenomeles Insects

Aphids may infest the twig tips and lower leaf surfaces. Use sprays of malathion or rotenone. The insects can also be dislodged by high pressure water spray from the garden hose.

Chamaecyparis obtusa Hinoki Cypress

Hinoki cypress can stand 100 feet tall and spread 20 to 30 feet. In landscape situations, the tree is seen in the form of one of its many cultivars. It has a moderate growth rate and does not tolerate air pollution. Hinoki cypress prefers cool, moist soil and tolerates partial shade, though it prefers a sunny location. Sun scorch can be a problem on cultivars with colored foliage.

There are many cultivars, some quite dwarf. Other cultivars have excellent foliage coloration or unusual growth habit. Cultivars include: 'aurea'—golden foliage; 'caespitosa'—rare, miniature, about 6 inches tall; 'compacta'—dwarf, about 3 feet tall, dense, conical; 'coralliformis'—branchlets reddish and contorted; 'cripsii'—a dwarf with golden foliage; 'erecta'—columnar habit; 'ericoides'—low, blue-gray foliage; 'filicoides'—fern-like; 'gracilis'—compact growth habit, tips of branchlets pendulous; 'kosteri'—dwarf, 3 to 4 feet tall, branch tips curved; 'mariesii'—dwarf, foliage variegated with yellowish white; 'nana'—very dwarf, height and spread of 2 feet; 'pygmaea'—dwarf, 2 feet tall, wider than tall; 'Stoneham'—slow, dwarf, tiered branching; 'tetragona'—slow, dwarf, erect.

Chamaecyparis pisifera Sawara False Cypress, Retinospora

Grow false cypress cultivars in a sunny location in moist, well drained loam. The plants transplant reasonably well when root pruned, but the height, spread and growth rate depend on the cultivar selected. Some of the cultivars listed grow too large for use in foundation plantings. There may be problems with sun scorch.

Cultivars are: 'aurea nana'—dwarf, 3 feet tall, yellow foliage; 'Boulevard'—3 to 8 feet tall, bluish foliage; 'filifera nana'—dwarf, 2 1/2 feet tall, branchlets pendulous, threadlike; 'Golden

Mop'—3 feet tall, foliage yellow, threadlike; 'nana'—dwarf, 2 feet tall, dense, spread is twice the height; 'plumosa compressa'—dwarf, 2 feet tall, rounded, dense; 'plumosa rogersii'—dwarf, 3 feet tall, golden yellow foliage; 'squarrosa minima'—dwarf, 3 feet tall, dense, mosslike foliage.

Chamaecyparis Diseases

Blight caused by *Phomopsis juniperovora* can be a problem on young plants in nurseries or old plants in landscape situations. In young plants, branch tips turn brown and die back until the whole branch or young tree is killed. Trees over five years old are less susceptible. When older trees in landscapes are affected by tip blight, entire trees are seldom killed. Benomyl used at bud break, then two to three additional times at 10- to 14-day intervals, controls the disease.

Tip blight caused by *Pestalotia funerea* can infect trees during wet weather. The disease causes sooty pustules on the leaves, bark and cones.

Scorch may look like a disease but is caused by excessive direct sun, freezing stress, drought or mites. Freezing stress can be prevented by shading small plants in winter.

Chamaecyparis Insects

Juniper scale can be controlled by applying Sevin when the crawlers are active.

The bagworm webs dead foliage together to make a nest. The covering makes the insect difficult to control. Use sprays of Sevin, malathion or *Bacillus thuringiensis*. The nests can be picked off by hand.

Chionanthus virginicus Fringe Tree

Fringe tree grows best in a sunny spot sheltered from wind. The tree prefers moist soil and grows slowly in clay or acid soil. The plant grows 20 to 30 feet tall and spreads to 25 feet. Fringe tree grows slowly and may be hard to transplant. The tree tolerates city conditions but does not tolerate much pruning. Leaves emerge later in the spring than those of most plants, and the fall color is yellow. The flowers can be forced into early bloom indoors. The white flowers are in hanging clusters and are present in May and June.

Female plants develop blue fruits after the blooms fall.

Chionanthus Diseases

Leafspots can be caused by several genera of fungi. Leafspots caused by *cercospora* and *septoria* are controlled with sprays of benomyl. Most years, the leafspots are not a problem.

Powdery mildew of various genera may attack fringe tree. Use benomyl according to label directions.

Chionanthus Insects

Scale can be controlled with dormant oil sprays applied before plant growth begins in spring. Control crawlers with sprays of Sevin. The preferred method of control involves regularly inspecting plants for early detection of the infestation, then spraying with dormant oil.

Clethra alnifolia Summersweet, Sweet Pepperbush

Summersweet is 3 to 10 feet tall and 3 to 8 feet wide at maturity. The shrub grows best in partial shade and a moist, slightly acid soil. The plant tolerates wetness but on poor sites is thin and straggly. Summersweet is hard to transplant and slow to recover from transplanting. The shallow root system is suckering and tends to form clumps. Summersweet bears fragrant, white flowers in early to midsummer. The erect, 4- to 6-inch long racemes of flowers are long lasting. The fall color is yellow to orange.

Several cultivars are available: 'paniculata'—leaves narrower, flowers larger; 'Pink Spire'—flowers pinkish; 'rosea'—flower buds pink, flowers pinkish but fading to white.

Clethra barbinervis Japanese Clethra

Japanese clethra has interesting horizontal racemes of white flowers. The plant grows 30 feet tall and may not be as susceptible to mites as *C. alnifolia*. The bark adds interest after the leaves drop.

Clethra Insects

Mites are usually not seen because they are so

small. The main symptom is a fading away of green foliage color and development of a yellowish or stippled appearance. Sprays of kelthane control the problem.

Cornus alba Tatarian Dogwood

Tatarian dogwood grows in sun or shade and tolerates most soil types. The plant reaches 4 to 10 feet tall and spreads 3 to 12 feet. Growth and recovery after transplanting are slow. Young shrubs have erect branches that become more arching with age. The 2-inch clusters of white flowers are followed by white or bluish fruits. In winter the twigs are bright red. Variegated-leaved cultivars are not as vigorous as those with all green leaves. The shrub resembles *Cornus stolonifera* but does not spread as rapidly.

Cultivars include: 'argentea marginata'—leaves bordered with white; 'gouchaultii'—leaves variegated yellowish and pink; 'siberica'—brilliant red twigs; 'spaethii'—leaves bordered with yellow.

Cornus mas Cornelian Cherry

Cornelian cherry is a small tree or large shrub. It prefers sun or partial shade and a well drained soil. The growth rate is moderate and young plants transplant easily. A height of 20 to 25 feet and spread of 15 to 28 feet can be expected. The yellow flowers are produced in very early spring. The red fruit is edible and is partially hidden by the leaves. The fall color is red. Cornelian cherry may be used as a hedge plant.

Several cultivars are listed but may not be readily available: 'albo-carpa'—white fruit; 'aureo-elegantissima'—leaves yellow, green and pink; 'flava'—yellow fruits; 'fructu violaceo'—purple fruits; 'macrocarpa'—larger fruits; 'nana'—dwarf, 3 feet tall, 'variegata'—leaves with white variegations; 'xanthocarpa'—yellow fruit.

Cornus officianalis Japanese Cornel

Japanese cornel looks like *Cornus mas*, cornelian cherry. The bark of *C. officianalis* is more ornamental, but it is hidden by the leaves. The

flowers are larger and later than those of *C. mas*, but otherwise the trees are much the same.

Cornus racemosa Gray Dogwood, Panicked Dogwood

Gray dogwood grows to 6 to 15 feet in height and width. The best growing area has sun or partial shade and moist soil. The plant grows in wet areas and has a fibrous, suckering root system. Excessive sucker formation may cause the plant to overrun its allotted space. The dense growth habit makes the shrub a suitable hedge or barrier plant. Gray dogwood sprouts readily from the base and can be cut back severely. The clusters of white flowers are produced in mid- to late spring. The white fruits are on red peduncles and are more ornamental than the flowers. When birds eat the fruit, the remaining red peduncles give the plant a reddish color. The fall color is purplish red.

Cornus sanguinea

This shrub has reddish bark, white flowers and blue-black fruit. It is not especially ornamental but has cultivars with more ornamental traits.

Cornus sericea (stolonifera) Red Twigged Dogwood, Red Osier Dogwood

Red twigged dogwood has bright red winter twig coloration. It tolerates most light exposures and moist soils. The plant grows to 8 feet tall and 10 feet wide. The growth rate is slow, especially after transplanting, and the root system produces suckers.

Three cultivars are listed: 'flaviramea'—greenish yellow twigs; 'kelseyi'—low growing, compact, 24 to 30 inches tall; 'nitida'—green twigs.

Cornus Diseases

Several genera of fungi are all possible leafspot pathogens. Use sprays containing basic copper sulfate.

Several genera of powdery mildew cover the leaves with a white, powdery growth. Late season attacks may be ignored. Earlier infections can be

controlled with sprays of benomyl or sulfur.

Twig blights cause twig dieback when cankers girdle the stem. Prune out the twig below the point of infection.

Cornus Insects

Scale insects are small and blend in with twigs or branches. Apply dormant oil before spring plant growth begins to control them. Oystershell scale crawlers are controlled with sprays of malathion. Sprays of Sevin also control crawlers. The preferred method of control involves regularly inspecting plants for early detection of the infestation, then spraying with dormant oil.

Corylopsis pauciflora

This member of the genus is somewhat more tender than the others. It bears fragrant, yellow flowers, two to three on a spike. It is a dense, spreading shrub. Grow it in a sunny, sheltered location and in light, well drained soil.

Corylopsis sinensis Chinese Winter Hazel

This plant grows 10 to 12 feet tall and may need protection from the wind. The yellow flowers are produced in early spring. Grow it in a sunny, sheltered location in a light, well drained soil.

Corylopsis spicata

This corylopsis grows 3 to 4 feet tall and has yellow flowers in drooping clusters. Grow it in a light, well drained soil in a sunny, sheltered location.

Corylus avellana European Filbert

Some filberts are ornamentals as well as nut producers. Most prefer a sunny, open location with any good soil. The plant grows 3 to 8 feet tall and spreads from 5 to 10 feet. This is a rapid grower that may occasionally go to 20 feet. The root system is fibrous and suckering and can spread to form thickets, if not controlled.

Cultivars include: 'aurea'—yellow leaves; 'contorta' (Harry Lauder's Walking Stick)—branches

twisted and contorted; 'fusco-rubra'—purple leaves; 'heterophylla'—cut leaves; 'pendula'—weeping habit; 'purpurea'—purplish leaves.

Corylus Diseases

Crown gall caused by *Agrobacterium tumefaciens* causes formation of roundish, warty-looking galls on the lower stem near ground level. There is no satisfactory chemical control. Avoid planting in infected soil.

Several fungi cause cankers and twig blight. The branch dies when the stem is girdled. Prune out infected branches below the point of infection.

Several genera of fungi cause leafspots. Severe infections may cause leaf drop. Spray with basic copper sulfate.

Powdery mildew of various genera form a white coating on the leaves. Severely infected leaves turn yellow and fall. Use sprays of benomyl or sulfur.

Corylus Insects

Orange-striped oakworm is black with orange stripes running the length of its body. It has two long spines near its head and shorter spines on other parts of its body. The insect eats the leaves but is so rare or occurs in such low numbers that control is usually not needed.

Cotinus coggygria Smoke Tree, Wig Tree, Smokebush

Smoke tree grows best in a sunny location and a well drained loam. Though short-lived in rich soil, smoke tree is useful in dry, rocky soil. This slow growing plant grows to 15 feet tall and 15 to 20 feet wide. The large panicles of flowers produced in early summer give the effect of a cloud of smoke. The fall color is usually good and ranges from yellow to orange.

Cultivars include: 'Daydream'—heavy production of panicles; 'purpurea'—the fruiting panicles and leaves are purplish. There are several named cultivars of 'purpurea': Flame, Notcutt's Variety, Royal Purple, Royal Red and Rubrifolius.

Cotinus Diseases

Leafspots can be caused by various genera of fungi

but are usually not serious. Spray with basic copper.

Scab may cause leaf drop. No controls are listed for scab caused by *Venturia inequalis* on this host.

The most serious disease is Verticillium wilt. Smoke tree is very susceptible, and entire branches wilt and die. Prune out infected branches, and fertilize and water the plant.

Cotinus Insects

Oblique-banded leaf roller mines and rolls the leaves, usually in June. The insect rarely occurs in sufficient numbers to warrant control. When it does occur, they can be picked off by hand or sprayed with *Bacillus thuringiensis*.

Cotoneaster adpressa Creeping Cotoneaster

Creeping cotoneaster prefers a sunny location and grows in any good garden soil. The plant dislikes too much moisture and is hard to transplant. The branches root where they touch the soil. The plant grows 1 to 1 1/2 feet tall and spreads to 9 feet. The growth rate is slow, probably the slowest of the cotoneasters. The main ornamental features are red berries, most ornamental in fall and winter, and the red fall color.

Several cultivars are listed: 'Little Gem'—dwarf, with no flowers or fruits; 'Park Carpet'—low growing, good fruit production; 'praecox'—faster growing.

Cotoneaster apiculata Cranberry Cotoneaster

Cranberry cotoneaster differs little from the others in its cultural requirements. It grows 3 feet tall and produces bright red berries in the fall. No cultivars are listed.

Cotoneaster horizontalis Rock Cotoneaster, Quinceberry, Rock Spray

Rock cotoneaster has a low, spreading habit, growing 2 feet tall and spreading 5 to 8 feet. The fishbone branching pattern adds interest. The plant tolerates sun and wind and can be used

as a ground cover. A good growing area is sunny with a well drained garden soil. The plant dislikes shade and moisture and is hard to transplant. The main ornamental feature is the persistent red fruit. The fall color is deep red to orange and the growth rate slow.

Several cultivars are listed: 'perpusilla'—leaves smaller; 'Tom Thumb'—finely branched; 'variegata'—leaves edged with white.

Cotoneaster multiflora (floribunda, multiflorus) Large-Flowered Cotoneaster

Large-flowered cotoneaster is one of the few cotoneasters useful for its flowers. It is not often grown, possibly because it is susceptible to fireblight. Large-flowered cotoneaster needs sun to partial shade and any good garden soil. It has a height and spread of about 8 feet and produces white flowers in mid-May. The red fruit and the yellow fall color occur together. The growth habit is normally graceful and drooping.

One cultivar is listed: 'calocarpa'—larger, more numerous fruit.

Cotoneaster Diseases

Leafspots are a rare problem caused by one of several fungi. Use a spray of basic copper sulfate.

Cankers or twig blights are caused by fungi in the genera *Phyalospora*, *Diplodia* and *Gibberella*. When a canker girdles the stem, the growth beyond the point of infection dies. There is no chemical control. Prune out the infected stems.

Cotoneasters are susceptible to fireblight, though *C. adpressa* is reportedly resistant. There is no chemical control for the disease. The disease kills the branch tips and the leaves appear scorched. Prune out infected twigs and avoid using high nitrogen fertilizer.

Cotoneaster Insects

Hawthorn lacebug causes a gray, lacy spotting of the upper leaf surfaces. Brown specks on the lower leaf surfaces are insect excrement. Use Sevin dust or sprays of acephate.

Several scale insects attack cotoneaster, including oystershell and San Jose scale. The insects can

build up to large numbers without being seen. Sprays of dormant oils applied in the spring kill overwintering scales. Crawlers can be controlled with sprays of Sevin or acephate. Oystershell scale crawlers may be controlled with malathion. A combination of regular inspection for early detection and then a dormant oil spray is the preferred method of control.

Daphne mezereum Mezereon

This shrub grows well in some spots but a short distance away may do poorly. The plants grow 2 to 3 feet tall and bear pink flowers quite early. They are followed by red berries. *Daphne* is poisonous and hard to transplant.

There are several varieties: 'alba'—white flowers and yellow fruit; 'plena' ('alba plena')—flowers white and double; 'grandiflora'—flowers purple and early, grows to 6 feet, can bloom in autumn.

Daphne Diseases

Leafspots caused by fungi in the genera *Gloeosporium* and *Marssonina* cause leaves to die and drop off. Severe infections kill the twigs. Prune out and destroy infected tissue. Use basic copper sulfate sprays.

Crown rots of several types may be a problem in wet soil. There is no chemical control for these diseases.

Canker caused by *Nectria cinnabarina* causes stem death. The fungus may be identified by its reddish fruiting bodies. There is no chemical control for this disease. Prune out and destroy infected tissue.

Daphne Insects

Aphids cause distorted new growth and may cover the leaves with sticky honeydew. Use sprays of malathion, Sevin or rotenone. The insects can be dislodged with high pressure water spray from the garden hose.

Deutzia gracilis

Deutzia grows in sun, partial shade or shade, but shade reduces blooming. Plant in a light, well drained soil. *Deutzia* grows 2 to 3 feet tall, occasionally 6 feet, and is 3 to 4 feet wide.

It is a low, mound-shaped shrub that stays low naturally. It grows slowly but transplants well. The white flowers are produced in midspring after the leaves develop. The plant does not tolerate pruning and blooms poorly if overpruned.

Cultivars include: 'carminea'—large pink flowers; 'eximia'—white flowers flushed with pink; 'rosea'—flowers tinged with pink.

Deutzia Diseases

At least two leafspots attack *deutzia*, but neither is serious. Serious infections are controlled with a spray containing basic copper sulfate.

Deutzia Insects

Aphids can cause distortion of the new growth. The leaves may be covered with sticky honeydew. Use sprays of rotenone, malathion or Sevin. The insects can also be dislodged with high pressure water sprays from the garden hose.

A leafminer causes tan blotches on the leaves. No chemical control is listed. Insects feeding in the leaves can be crushed by hand.

Dirca palustris Leatherwood

Leatherwood needs exposure to sunlight. It grows best in ordinary garden soil but may be used in moist soils. It is quite hardy, grows 3 to 5 feet tall and has yellow flowers in the spring before the leaves appear.

Euonymus alatus Winged Burning Bush, Burning Bush, Winged Euonymus

Burning bush has outstanding red fall color and corky wings on the twigs. The plant is shade tolerant but has inferior fall color and reduced density in shade. Plant in an area with sun or partial shade and any good garden soil. Burning bush transplants easily, grows slowly and may be sheared. The wings hold winter snow, outlining the branch structure. The plant has a height and spread of 8 to 10 feet. The fruit is ornamental if produced in quantity, but plants vary in the amount of fruit they produce.

The cultivar 'compactus'—dense, a dwarf about 7 feet tall—is probably used more than the species.

Euonymus bungeana
Midwinter Euonymus, Winterberry
Euonymus

This is a large, fast growing plant that reaches a height and spread of 18 feet. The branches are almost pendulous, giving the plant a drooping effect. The main ornamental characteristic is the pinkish fruit.

Cultivars include: 'North Platte'—good fruit production; 'pendulus'—drooping branchlets; 'semipersistens'—fruits abundant and persistent.

Euonymus europaeus
Spindle Tree

Spindle tree is one of the larger types of euonymus. It grows 12 to 30 feet tall and spreads 10 to 25 feet. It has no particular soil preference and grows best in sun or partial shade. The growth rate is moderate and it transplants easily. The red and orange fall fruits are the main ornamental feature.

Cultivars include: 'albus'—white fruit; 'aldenhamensis'—showy fruit; 'intermedius'—bright red fruit; 'plumilius'—dwarf.

Euonymus fortunei
Wintercreeper

Wintercreeper can be a trailing, vinelike plant or an upright shrub, depending on the cultivar. The plant can reach a height of 2 to 3 feet and spread 3 to 4 feet, but climbing types will reach a chimney top on a two-story house. Transplanting is no problem, but the growth rate is slow. A north or west exposure is best—during the winter, shade will keep the foliage from burning. If used as a ground cover, it can be sheared to keep it neat. This member of the genus is the most susceptible to euonymus scale, so it should not be selected for low maintenance landscapes. Large plants become heavily infested before the insect is noticed.

A number of cultivars are listed, some with excellent summer foliage coloration: 'Berryhill'—an upright type; 'carreirei' (glossy wintercreeper)—a broadly rounded shrub when mature, lighter color, profuse fruiting; 'coloratus' (purpleleaf wintercreeper)—hardy, purplish leaves

in winter; 'Emerald and Gold'—leaves variegated with golden yellow; 'Emerald Gaiety'—leaves marked with white, upright; 'Golden Prince'—leaves marked with yellow, upright; 'gracilis'—leaves variegated with white and yellow; 'kewensis'—small, slow growing, small leaves; 'Longwood procumbens'—small, trailing; 'reticulatus'—leaves large with white markings along the veins; 'sarcocoe'—upright, green leaves; 'Silver Gem'—leaves larger, variegated with white; 'Silver Queen'—leaves with white variegations; 'vegetus' (bigleaf wintercreeper)—climber, large glossy leaves, often seen climbing on brick walls or chimneys.

Euonymus yedoensis
Yeddo Euonymus

Yeddo euonymus is grown for its numerous pale pink fruit. The plant grows in sun or partial shade and has no particular soil preference. It grows 10 feet tall and spreads 8 to 10 feet. The growth rate is slow. The fruits are not as persistent as those of spindle tree. This is a flat-topped shrub with a coarse texture.

Euonymus Diseases

Anthracnose, caused by fungi in the genera *Gloeosporium*, produces brown lesions containing black fruiting bodies on the leaves. No chemical control is listed.

Bacterial crown gall causes formation of galls on stems and roots. Severely infested plants should be destroyed; lightly infected branches may be pruned off and destroyed. Dip pruners in 70 percent denatured alcohol between cuts. No satisfactory chemical control is available.

Several leafspots may be seen. No chemical controls are listed.

Two fungi cause wilting and dieback of the branches. Phomopsis dieback is a problem on *E. fortunei* 'vegetus'. No chemical control is listed. Prune out infected branches.

Euonymus Insects

Aphids suck juices and coat the leaves with sticky honeydew. Use sprays of acephate, malathion, Sevin or rotenone. The insects can also be dislodged with high pressure water spray from the garden hose.

Feeding by mites causes yellowish or stippled leaves. If the infestation is heavy, fine webbing may be seen. Use sprays of kelthane or rotenone.

Euonymus scale appears as white flecks on the leaves and stems. Several other scale insects attack euonymus. Dormant oil sprays kill overwintering stages. Or use Sevin, malathion or acephate to control crawlers. The preferred method of control involves regularly inspecting plants for early detection of the infestation and then spraying with dormant oil.

Exochorda racemosa Pearl Bush

This shrub grows 10 to 15 feet tall and has white flowers 1¼ inches across. The plant prefers a sunny, open location and a loamy soil. Prune to thin occasionally.

The variety 'prostrata' has a prostrate growth habit.

Forsythia intermedia Golden Bell, Border Forsythia

Forsythia is one of the most common spring flowering shrubs, with its yellow flowers occurring before the leaves appear. Plant in a sunny growing area with a well drained soil. This rapid grower transplants well and is 8 to 10 feet tall and spreads 10 to 12 feet. Thin occasionally by cutting off old wood at ground level. After a severe winter, only the protected lower branches have flowers. Forsythia tolerates city conditions but not crowding.

Cultivars include: 'Beatrix Farrand'—flowers large, up to 2 inches in diameter; 'densiflora'—flowers pale yellow, upright growth habit; 'fortunei'—more erect growth habit; 'Karl Sax'—flower buds hardier; 'Lynnwood Gold'—flowers larger and more numerous; 'nana'—a dwarf with very poor flowering; 'primulina'—light primrose yellow flowers; 'spectabilis'—flowers larger and more numerous, less injured by frosts; 'Spring Glory'—flowers same as those of primulina but more numerous.

Forsythia suspensa Weeping Forsythia

Weeping forsythia is the same as border forsythia except for its weeping growth habit. The best growing area is sunny with any reasonable soil. Weeping forsythia transplants well and grows rapidly. The plant has a mature height and spread of 8 to 10 feet. The yellow flowers appear in the spring before the leaves. Weeping forsythia tolerates city conditions and is useful on banks because the branches root where they touch the ground.

There are several cultivars: 'atrocaulis'—young growth purplish; 'decipiens'—flowers on long stalks, a vigorous plant; 'fortunei'—upright growth habit; 'pallida'—pale yellow flowers; 'sieboldi'—flowers numerous, deep yellow, the branches long and slender.

Forsythia Diseases

Bacterial crown gall causes nodular growths along the stems that may kill them. Cut off and destroy infected canes, or destroy the entire plant if it's severely infected.

Several leafspots may be seen but are not serious and can be controlled with sprays of basic copper sulfate.

Dieback occurs when a fungus enters the blossoms and flower stalks. Twigs on infected stems die back. Prune out and destroy dead twigs and stems. No chemical control is listed.

Forsythia Insects

Four-lined plant bug causes round, brown spots on the leaves. The adult is either yellow or chartreuse with four black lines on its back. It is most common in May and June. The insect is relatively rare and is usually not serious. Use sprays of malathion.

Mites cause yellowing of the leaves. Use sprays of kelthane.

Fothergilla gardenii Dwarf Fothergilla

This shrub grows 2 to 3 feet tall and blooms early. The white flowers are 1 1/2 inches long and 1 inch wide and have no petals. The

parts that look like petals are actually stamens. The flowers are borne in the spring before the leaves. The plant likes a cool, moist root zone and a sandy loam. Little pruning is needed other than an occasional thinning of the older branches. The fall color is generally red and yellow. Branches may be layered in the autumn.

Fothergilla major Large Fothergilla

Large fothergilla is a slow grower with a mature height of 6 to 10 feet. The flowers are 3 inches long and the fall color is red and yellow. The flowers have no petals and the parts that look like petals are actually stamens. The flowers are borne in the spring before the leaves appear. The plant likes a cool, moist root zone and a sandy loam. Little pruning is needed other than an occasional thinning of older branches. Branches may be layered in the autumn.

Fothergilla monticola Alabama Fothergilla

Alabama fothergilla grows 6 feet tall and has spreading branches and a rounded habit. The white flowers are borne in mid-May and have no petals. The parts that look like petals are actually stamens. The flowers are borne in the spring before the leaves appear. The plant likes a cool, moist root zone and a sandy loam. Little pruning is needed other than an occasional thinning of the older branches. The fall color is generally red and yellow. Branches may be layered in autumn.

Halesia carolina Silver Bell, Snowdrop Tree, Carolina Silverbell

Carolina silverbell grows 30 feet tall and spreads 20 feet or more. It is a large shrub or small tree that grows best in sun or semi-shade and a rich, well drained soil. Carolina silverbell is short-lived, grows slowly and is easy to transplant. The plant tolerates pruning and is useful in shrub or woodland borders. The white,

bell-shaped flowers are produced in midspring. The flowers, produced with or before the leaves, are sometimes tinged pink.

One cultivar is listed: 'meehanii'—shrublike with small flowers.

Halesia monticola Mountain Silverbell, Tisswood

Mountain silverbell grows into a 90-foot tree in its natural habitat but is about 35 feet tall in gardens. The tree prefers sandy loam and begins blooming when 10 to 12 feet tall. The flowers are larger than those of *H. carolina*. The white, bell-shaped blossoms are borne in clusters of up to five. Flowering occurs in mid-May on the previous season's wood. Other ornamental features are the yellow fall color and the bark, which peels off in large, flat scales.

One cultivar is listed: 'rosea'—pale pink flowers.

Halesia Diseases

A leafspot caused by *Cercospora halesiae* may be seen but only rarely. Rake up and dispose of infected leaves. Use a fungicide containing basic copper sulfate.

Hamamelis intermedia 'Arnold Promise' Arnold Promise Witch-Hazel

Arnold Promise witch-hazel grows to 15 feet tall and prefers a light, well drained soil. The main ornamental features are the very early yellow flowers and the reddish fall color.

Hamamelis japonica Japanese Witch-Hazel

The flowers of this witch-hazel are yellow and slightly fragrant. The sepals are purplish. There are a few cultivars: 'arborea'—yellow petals, leaves larger; 'flavopurpurescens'—red flowers (several named cultivars have been selected from this variety); 'zuccariniana'—small flowers three weeks later, a vigorous shrub.

Hamamelis mollis Chinese Witch-Hazel

Chinese witch-hazel grows 20 feet tall and needs a light, loamy, well drained soil. The fragrant flowers are produced in March and have yellow, straplike petals becoming reddish near the base. The plant dislikes dryness and has a yellow fall color.

Cultivars include: 'brevipetala'—short petals, orange sepals; 'brevipetala feuerzauber'—red flowers; 'pallida'—pale yellow flowers.

Hamamelis virginiana Common Witch-Hazel

Common witch-hazel grows best in sun or partial shade and in light, moist soil. The plant tolerates dryness and grows slowly. It grows to 20 to 30 feet tall and spreads 20 to 25 feet. The fragrant flowers are produced in late fall to early winter and have straplike, yellow petals. This is the last shrub to flower during the year. The flowers are more interesting than ornamental, however. The fall color is yellow. The plant suckers freely and tolerates urban environments.

One cultivar is listed: 'rubescens'—reddish petals.

Hamamelis Diseases

Several genera of fungi are listed as causing leafspot on witch-hazel. Use a spray of basic copper sulfate.

Various genera of powdery mildew cause a white coating on the leaves. Use sprays of benomyl or sulfur.

Hamamelis Insects

Saddled prominent is a green to brown or yellow caterpillar with a reddish brown spot on its back. It eats the leaves. No chemicals are listed because outbreaks of the insect are short-lived. At other times, it is very rare.

Witch-hazel leaf gall aphid causes galls 1/2 inch long. The galls are green, sometimes with reddish tips, and are formed on the upper leaf surfaces. Natural enemies usually control this insect; hand picking and destroying infested leaves will also be helpful. Dormant oil applied before the plant grows will control this insect.

The spiny witch-hazel gall aphid causes galls 3/4 inch long with long, coarse spines. The galls are green tinged with red. Both this aphid and the previous one migrate to birch for part of their life cycle. Spray with dormant oil before the plants begin to grow in the spring.

Eastern tent caterpillar feeds on witch-hazel leaves. Removing the nest by hand will control the infestation.

Hibiscus syriacus Rose-of-Sharon, Althea, Shrub Althea

Rose-of-Sharon is valued for large flowers produced in mid- to late summer when few other shrubs bloom. The plant grows in sun or partial shade and in any soil. Rose-of-Sharon grows 8 to 10 feet tall and spreads 6 to 10 feet. The growth rate ranges from slow to moderate, and transplanting is easy. The single or double flowers are in shades of red, pink, white and purple, depending on the cultivar. Peak bloom takes place in August. Prune in late winter or early spring. Frequent severe pruning gives fewer but larger flowers; no or little pruning gives many small flowers. Young plants are not as hardy as older plants.

Many cultivars are listed but few will be seen in catalogs. Cultivars include: 'Admiral Dewey'—single, white flowers; 'Arden'—purple, semi-double flowers; 'Bluebird'—single, bluish purple flowers; 'Boule de Feu'—double, purplish red flowers; 'coelestris'—single, light violet flowers, blooms early; 'coerulis'—semi-double, light purple flowers; 'coerulis plenus'—double, lavender flowers; 'Duc de Brabant'—double, deep purplish pink flowers; 'Hamabo'—single, pale pink flowers, with reddish stripes halfway up the petals; 'Jeanne d'Arc'—double, white flowers; 'Lady Stanley'—semi-double, white flowers with bluish pink on each petal and red lines running half way up the petal; 'Leopoldii plenus'—double flowers, blushed pink; 'Lucy'—dark pink, double flowers; 'Mauve Queen'—mauve flowers; 'paeoniflorus'—double pink flowers; 'rubus'—rose pink, single flowers, petals darker at the base; 'Souvenir de Charles Breton'—semi-double, light purple flowers; 'totus albus'—single, pure white flowers; 'Woodbridge'—single flowers, reddish purple, darker at the base.

Hibiscus Diseases

If leafspots are seen, pick off and destroy the infected leaves or use sprays containing basic copper sulfate.

If bacterial leafspot causes problems, pick off and destroy infected leaves. No chemical control is listed.

Canker can kill branches or entire plants. Bright, reddish-orange fruiting bodies may appear on the bark. No chemical control is available. Prune out infected branches.

Flowers may be infected with blight caused by *Botrytis cinerea*. Use sprays of benomyl.

Bud drop can be caused by too much or too little water or overfertilization.

Hibiscus Insects

Aphids may cover the leaves with sticky honeydew. Use sprays of Sevin, rotenone, acephate or malathion. The insects can also be dislodged with high pressure water sprays from the garden hose.

Japanese beetles are particularly fond of the flowers. Use sprays of malathion, rotenone, Sevin or methoxychlor to control the adult beetles. The grubs in the lawn can be controlled with diazinon or milky spore disease.

Hydrangea arborescens Smooth Hydrangea

Smooth hydrangea grows in sun or shade and prefers rich, porous, moist soil. Transplanting is fairly easy and the growth rate is rapid. Smooth hydrangea grows 4 to 6 feet tall and spreads 5 to 8 feet. The plant often dies back during the winter, and if it's not pruned in early spring, the flower clusters become small. The white flowers are produced in midsummer and are green at first. Old flowers turn brown and persist on the plant for some time. The canes tend to be fairly weak.

Two cultivars are listed: 'Annabelle'—large flower clusters; 'grandiflora' (Hills of Snow Hydrangea)—all flowers sterile and showy; probably the most common cultivar. Use these cultivars instead of the less ornamental species.

Hydrangea quercifolia Oak-Leaved Hydrangea

Oak-leaved hydrangea has leaves shaped like oak leaves. The plant grows in sun or shade and prefers a rich, moist soil. It may not be as hardy as other hydrangeas. The top usually dies back during the winter, and it needs shelter from high winds. Oak-leaved hydrangea transplants easily and has a very coarse texture and good red fall color. The hairy young twigs are reddish. The growth rate is slow. The plant grows 4 to 6 feet tall and spreads 3 to 5 feet. The flowers, produced in midsummer in panicles, are at first white, then fade to pink and then tan.

Hydrangea Diseases

Bacterial wilt may blight the flower clusters and leaves. The disease is worse after heavy rains and hot weather. If severe, wilting and root rot occur, followed by plant death. The causal organism is *Pseudomonas solanacearum*, and no chemical control is available.

Bud or flower blight infects dense flower clusters in wet weather or after frost. The disease is caused by *Botrytis cinerea* and can be controlled with sprays of benomyl.

Several genera of fungi cause leafspots on hydrangea. Use a spray of basic copper sulfate.

Powdery mildews in various genera cover the undersides of leaves with light gray mold. The leaves turn brown in spots and the upper leaf surfaces stay green or turn purplish brown. Young stems and flower stalks are infected and killed. Use sprays of benomyl or sulfur.

Rust causes rusty brown pustules on the leaves. The pustules are most noticeable on the undersides of leaves. Infected leaves dry up and become brittle. Sprays of sulfur control rust.

Hydrangea Insects

Aphids distort the new growth and coat the leaves with sticky honeydew. Spray with Sevin, rotenone or malathion. The insects can be dislodged with a high pressure water spray from the garden hose.

Four-lined plant bug causes round, brown,

sunken spots on the leaves. The injury is often thought to be a disease. Sprays of malathion control the pest, although they will be needed only rarely.

A leaf tier webs the leaves over the tips of the branches. Some formulations of diazinon have a label for hydrangea leaf tier. The insects may also be picked off by hand.

Rose chafers are light tan with red, spindly legs, though they can be darker. They occur in large numbers where soils are sandy. Chemicals are ineffective because more rose chafers quickly move into a treated area to replace those killed by pesticides. If you want to try chemical treatment, use methoxychlor or rotenone.

Oystershell scale infests the upper stems of hydrangea and often goes unnoticed. Sprays of dormant oil should control overwintering stages and are less harmful to predators that help control scale. Control crawlers with sprays of malathion or Sevin. The preferred method of control is a combination of regular inspection to detect the infestation at an early stage, then sprays of dormant oil.

Mites cause yellowish foliage. Use sprays of kelthane.

Ilex verticillata

Michigan Holly, Northern Holly, Black Alder, Winterberry

Winterberry's bright red berries provide color in early winter after the leaves have fallen off. The plant grows in sun or partial shade and a rich, well drained soil, though it tolerates swampy areas. It grows 6 to 8 feet tall, spreads 3 to 5 feet and grows slowly. Winterberry is dioecious, so both male and female plants are needed for fruit production. The fruits are often eaten by birds.

Cultivars include: 'chrysocarpa'—yellow fruits; 'fastigiata'—narrow, upright; 'nana'—3 1/2 feet tall, large fruits; 'Winter Red'—dense branching, dark foliage, heavy fruit production.

Ilex Diseases

A large number of fungi cause leafspots on ilex. If serious, use sprays containing basic copper sulfate.

Various genera of powdery mildew form a fine white coating on the leaves. Spray with benomyl or sulfur.

Ilex Insects

Scale insects infest the stems and often aren't noticed until the plant shows leaf yellowing or other symptoms. Crawlers are controlled with sprays of Sevin or acephate. Have the scale identified to aid in timing the spray.

Juniperus chinensis

Chinese Juniper

Chinese juniper grows in sun or partial shade and any well drained soil. Transplanting is most successful with root pruned plants, moved potted or balled and burlapped. The height and spread depend on the cultivar selected, but the species grows 15 to 20 feet tall and spreads 2 to 4 feet. Several forms have bluish foliage and blue fruit. The plant dislikes crowding, has prickly foliage and grows rapidly.

Some of the many cultivars include: 'Armstrongii'—about 4 feet tall, dense, bluish green foliage, not common; 'hetzii' (Hetzi Juniper)—15 feet tall, bluish foliage, often placed in foundation plantings where it soon becomes too large; 'Old Gold'—similar to Pfitzer but denser and lower, with gold to bronze tinted foliage; 'pfitzeriana' (Pfitzer Juniper)—about 10 feet tall and very broad, often placed in foundation plantings where it becomes too large; 'pfitzeriana glauca'—foliage bluish during the growing season, purplish in winter; 'pyramidalis'—dense, pyramidal, opening at the base with age; 'San Jose'—prostrate; 'Sargentii'—almost a ground cover, bluish foliage, sometimes listed as being twig blight resistant.

Juniperus horizontalis

Creeping Juniper

Creeping juniper has many excellent low-growing cultivars. It tolerates exposed sites and a wide range of soils. It has a moderate growth rate, and the species can reach 4 feet tall and spread 8 feet.

Cultivars include: 'Bar Harbor'—hardy; 'douglasii' (Waukegan Juniper)—trailing habit, bluish foliage; 'Emerson' (Black Hills Creeper)—very prostrate, less than 1 foot high, blue foliage, tolerates dry soil; 'plumosa' (Andorra Juniper)—low growing, foliage purplish in fall; 'wiltonii' (Blue Rug Juniper)—bluish foliage, very low growing.

Juniperus virginiana Red Cedar

Red cedar can grow 40 to 50 feet tall. It grows rapidly, needs a sunny location and is quite tolerant of pruning. There are several shrublike cultivars.

Juniperus Diseases

Twig blight causes the tips of infected branches to turn brown. The disease is most serious on young plants. Infected tips should be pruned out and destroyed.

Cedar-apple rust forms galls on some types of juniper. During the spring, the galls may send out orange, jellylike spore horns. The disease is not serious on juniper but can be a problem to the alternate host, apple. To control the disease on juniper, spray nearby alternate hosts with sulfur in the spring.

Juniperus Insects

Bagworm caterpillars web foliage together to make bags up to 2 inches long. The insects live in the bags and emerge to feed on the foliage. Use sprays of malathion, acephate, Cygon, Sevin or *Bacillus thuringiensis*. The insects can also be picked off the plants by hand.

Juniper scale causes yellowed needles, and infected branches fail to produce new growth. The scale is round and at first white, later turning gray or black. Crawlers are controlled with sprays of Sevin or acephate.

The juniper webworm webs twigs and needles together, causing them to brown and die. The larva is 1/2 inch long and is brown with darker stripes. The larvae are often in the densest part of the plant and can go unnoticed. No chemical controls are listed.

Mites cause stippled and bronzed foliage. Use sprays of kelthane.

Kolkwitzia amabilis Beautybush

Beautybush grows 6 to 7 feet tall and spreads to 9 feet. It is a slow grower that transplants poorly but grows in any well drained soil. Cut off the branch tips of young plants to promote increased density. The shrub tolerates pruning, and it may be used in hedges, though much of the flowering effect and arching branching habit is lost. Flowering is best in the sun, but the plant tolerates some shade. The pink flowers are produced in late spring.

No cultivars or pest problems were found listed for beautybush.

Leucothoe fontainsiana (catesbaei) Drooping Leucothoe

Drooping leucothoe requires an acid soil. The soil texture can be a moist loam or a sandy peat, but the pH should be between 4.5 and 6.5. The plant grows in shade or partial shade and is 3 to 6 feet tall and 2 to 4 feet wide. The growth rate is slow but transplanting is fairly easy. Cut out some old canes occasionally to keep the plant vigorous. The white flowers are produced in early spring in axillary racemes that hang below the branches. The autumn foliage color is bronze changing to purplish during the winter. Hardiness in Michigan is questionable.

Cultivars include: 'Girard's Rainbow'—leaves with variegations of several colors in the spring that are nearly gone by August; 'nana'—dwarf, about 2 feet tall, spreading with age; 'tribar'—multicolored foliage.

Leucothoe Diseases

Several leafspots may affect leucothoe. Pick off and destroy infected leaves if the infection is light. Use sprays of basic copper sulfate for more serious infections.

Leucothoe Insects

Lacebugs cause leaves to become speckled with yellow or entirely yellow, depending on the severity of the infestation. Dark drops of insect excrement are seen on the undersides of the leaves. No chemical control is listed.

Ligustrum vulgare Common Privet

Common privet is grown as a hedge plant because it tolerates shearing and is quite dense. It grows 12 to 15 feet high and spreads 12 to 15 feet. The plant is highly branched but quite irregular in shape if not sheared. Privet tolerates most light exposures but is not as dense in the shade. It is easily transplanted and grows rapidly. The white flowers are often sheared off in early summer. The fruit is glossy and black but not particularly ornamental.

Cultivars include: 'pendulum'—drooping branches; 'pyramidale'—erect branches; 'sempervirens'—nearly evergreen.

Ligustrum x vicaryi Golden Vicary Privet

Golden vicary privet grows 12 feet tall and tolerates shearing. The golden yellow foliage fades to a sickly chartreuse in shade. The leaves persist on the plant well into the winter.

Ligustrum Diseases

Anthracnose, or twig blight, is caused by *Glomeralla cingulata*. It causes leaves to dry out, though they remain attached to the stem. Cankers form on the main stems, then the bark splits open to expose the wood. The stem dies when girdled. Prune out the diseased branches.

Several leafspots may be seen when the weather is rainy or plants are crowded. Spray with basic copper sulfate.

Powdery mildews of various genera cause whitish areas on the leaves. Use sprays of benomyl or sulfur.

Ligustrum Insects

Aphids cause the leaves to be coated with sticky honeydew. Spray with malathion, rotenone or Sevin. The insects can also be dislodged with high pressure water spray from the garden hose.

Leafminers cause brown areas on the leaves. No chemical controls are listed.

Privet thrips cause the foliage to become grayish

and take on a dusty appearance. Use sprays of malathion, rotenone or Sevin.

Scales of several types may infest privet. Examine the stems closely—the insects are not easily seen. Overwintering stages are controlled with dormant oil sprays applied in the spring. Crawlers can be controlled with sprays of Sevin. The preferred method of control is a combination of regular inspection to detect the infestation early and then sprays of dormant oil.

Mites cause the foliage to turn yellowish or stippled. Heavy infestations form fine webbing on the leaves. Control with sprays of kelthane.

Lonicera tatarica Tatarian Honeysuckle

Tatarian honeysuckle is a tolerant, reliable shrub with good flowering and fruiting habits. It grows in sun or partial shade and any garden soil. Transplanting is easy and the growth rate rapid. The fragrant pink, red or white flowers are produced in midspring. The red, orange or yellow fruit is most ornamental during the summer. Fruit and flower colors vary with the cultivar. The plant grows 10 to 12 feet tall and spreads 10 to 12 feet.

Several cultivars are listed but few are readily available. Cultivars include: 'alba'—white flowers; 'Arnold Red'—dark red flowers; 'grandiflora'—large, profuse flowers; 'leroyana'—dwarf, produces few flowers; 'lutea'—pink flowers, yellow fruits; 'Morden Orange'—pale pink flowers, orange fruits; 'nana'—pink flowers, dwarf habit; 'parvifolia'—white flowers; 'rosea'—pink flowers; 'sibirica'—deep pink flowers; 'virgialis'—large, rose pink flowers; 'zabelii'—red flowers.

Lonicera Diseases

Many fungi cause leafspots, but chemical control is rarely warranted. If necessary, use basic copper sulfate.

Leaf blight caused by *Herpobasidium deformans* results in dead leaves. No chemical control is listed.

Various genera of powdery mildews form white powder on the leaves. Use sprays of benomyl or sulfur.

Bacterial crown gall causes round, warty-looking growths on the stems near the soil line. Dig out and destroy infected plants.

Lonicera Insects

Aphids suck plant juices and coat the leaves with sticky honeydew. Spray with Sevin, rotenone or malathion. The insects can also be dislodged with high pressure water sprays from the garden hose.

Leafrollers roll leaves together, then web them in place. Use Sevin before the leaves are rolled or hand pick infested leaves.

Four-lined plant bug causes sunken, round, brown spots on the leaves. The injury is sometimes mistaken for a disease. Adult insects are yellowish green with black stripes. Use sprays of malathion.

Scale insects infest the stems and branches. Close inspection may reveal these insects crusted on the bark. Spray with dormant oil in the spring. Crawlers are controlled with Sevin. The preferred method of control involves regular inspection to detect the infestation early, then a dormant oil spray.

Magnolia stellata Star Magnolia

Star magnolia is the hardiest of the magnolias. It is a small tree or large shrub growing 20 feet tall and spreading 10 to 15 feet. The plant is intolerant of shade, root competition or dryness, and it grows slowly. Plant in a rich, porous and slightly acid soil. Star magnolia is hard to transplant and should be moved balled and burlapped when actively growing. White flowers are produced in spring before the leaves appear, even on young plants.

There are a few cultivars: 'keiskei'—flowers purplish on the outside; 'rosea' (Pink Star Magnolia)—pale pink flowers; 'rubra' (Red Star Magnolia)—purplish flowers, darker than 'rosea'; 'Waterlily'—pink flower buds, white flowers, flowers larger with narrower petals.

Magnolia Diseases

Leafspots are usually not serious. Rake up and dispose of infected leaves. Use sprays of basic cop-

per sulfate on serious infections.

Dieback starts as longitudinal cankers or cracks on larger limbs and trunks. The wood is discolored and blue gray. There is no chemical control for this disease.

Nectria canker causes plant dieback. Prune out and destroy infected wood and keep the plants healthy by watering and fertilizing.

Magnolia Insects

Several scale insects infest magnolia. The most common is magnolia scale, measuring up to 1/2 inch in diameter. Immature scales have a whitish covering. Plants infested by scale are weakened and leaves may not develop normally. Stems appear abnormally enlarged or lumpy. Sprays of dormant oil control overwintering stages and are less harmful to the predators that help control scales. Sprays of Sevin or acephate control crawlers. Identify the specific scale so you can apply crawler sprays at the proper time. The preferred method of control involves regular inspection to detect the insect early, then a dormant oil spray.

Mahonia aquifolium Oregon Grape, Oregon Grape-Holly, Oregon Holly-Grape

Mahonia leaves look like holly leaves, and the blue fruits have the coloration of grapes. Another ornamental feature is yellow flowers. Sun or shade is suitable except in winter, when shading is needed to keep the purplish leaves from browning. Transplanting is most successful with either potted or balled and burlapped plants. The plant is 3 to 7 feet tall and spreads 3 to 5 feet. The growth rate is moderate. The root system is suckering.

Cultivars include: 'compacta'—about 3 feet tall; 'Mayhan Strain'—dwarf with glossy leaves; 'repens'—can be used as a ground cover.

Mahonia Diseases

Several leafspots may be seen, but infected leaves can be picked off and destroyed. Spray with basic copper sulfate.

Philadelphus coronarius Mock Orange, Sweet Syringa

Mock orange is grown for its fragrant, white flowers, produced in late spring after the leaves. Flowering is best in full sun, but the plant tolerates shade. Mock orange tolerates most soils and transplants well. It has a mature height and spread of 10 to 12 feet. The growth rate is slow and the young bark is orange. Mock orange tolerates shearing, but the effect of the growth habit is lost.

Cultivars include: 'aureus'—yellow foliage in spring and early summer; 'dianthiflorus'—large, double flowers; 'duplex'—dwarf with double flowers; 'grandiflorus'—flowers larger, later and less fragrant; 'nana'—dwarf, grows up to 4 feet; 'salicifolius'—narrow leaves.

Philadelphus Diseases

A canker caused by *Nectria cinnabarina* kills the stems. Prune out and destroy infected stems. There is no chemical control for the disease.

Leafspots of various types may be a problem in rainy seasons. Pick off and destroy infected leaves. Use basic copper sulfate for severe infections.

Powdery mildews of various genera cause a white coating on the leaves. Use sprays of benomyl or sulfur.

Philadelphus Insects

Aphids suck plant juices and coat the leaves with sticky honeydew. Spray with Sevin, rotenone, acephate or malathion. The insects can also be dislodged with high pressure water spray from the garden hose.

Picea abies Norway Spruce

Norway spruce can grow 80 to 100 feet tall and spread 25 to 35 feet, though listed cultivars are shrublike. With age the top becomes open and the branchlets droop. Norway spruce tolerates most soils if moist and transplants easily if balled and burlapped or potted.

There are a number of cultivars of Norway spruce. Some are dwarf and shrublike, while

others are trees. Not all will be available in nurseries. Cultivars include: 'clanbrassiliana'—dwarf, about 4 feet tall and twice as wide; 'columnaris'—narrow, columnar; 'echiniformis' (Hedgehog Spruce)—a rounded dwarf, broad; 'gregoryana'—rounded, broad, about 3 feet tall but much wider, slow growing; 'humulis'—about 2 feet tall; 'inversa'—drooping habit; 'maxwelli'—4 feet tall and 10 feet wide, slow growing, dense; 'nidiformis'—dwarf, very dense mound; 'nigra'—densely branched, dark green; 'pendula'—weeping; 'procumbens'—flat, dense, can be 3 feet tall; 'pumila'—spreading, about 4 feet tall; 'pygmea'—conical, slow growing; 'pyramidata'—narrow, slender pyramid; 'reflexa'—branchlets pendulous, 1 foot high but 10 feet wide; 'repens'—flat and prostrate, less than 3 feet tall but quite wide; 'stricta'—slender, spirelike.

Picea glauca 'conica' Dwarf White Spruce

Dwarf spruce grows slowly—even after many years it will be only 10 feet tall. It has no particular soil preference but needs a sunny exposure.

Picea pungens Colorado Spruce

Colorado spruce has a horizontal branching habit and grows taller than 75 feet. The tree grows slowly and may be difficult to transplant. Colorado spruce casts dense shade when branched to the ground, so no grass grows beneath it. The tree prefers a rich, moist soil.

A number of cultivars are listed. The most common cultivar is 'glauca', the blue Colorado spruce. The blue trees are sometimes grown from seeds, so they vary in degree of blue coloration. For reliable blue color, purchase a grafted, named cultivar selected for its blue color. The list of cultivars is not long: 'argentea' (silver Colorado spruce)—silvery foliage color; 'glauca' (blue Colorado spruce)—bluish foliage; 'glauca procumbens'—bluish foliage, height about 2 feet but spread several times the height; 'globosa'—3 feet tall, blue foliage; 'hoopsii'—bluish foliage; 'moerhiemii' (Moerhiem spruce)—compact, dense and very blue; 'pendens' (Koster's blue spruce)—

weeping habit, must be staked to get it to take tree form, blue foliage; 'thompsoni'—bluish foliage.

Picea Diseases

Cytospora canker causes the branchlets to turn brown and die. White resin patches appear on infected branches. Prune out infected branches. There is no chemical control. Reduce the incidence of Cytospora canker by fertilizing yearly and by watering as needed during dry weather.

Picea Insects

Spruce budworm feeds on the opening buds and webs the needles together loosely. The caterpillar is reddish brown with a yellow stripe on the side. No chemical control is listed.

Spruce needle miner tunnels in the needles, then webs dead needles together. Look for small holes in the bases of infested needles. Use sprays of diazinon or acephate.

Pine needle scale is white and attacks low vigor spruces. Spray with dormant oil before the trees begin to grow. Crawlers are controlled with sprays of malathion, acephate, Sevin or diazinon. The preferred method of control involves regularly inspecting plants for early detection of the infestation and then spraying with dormant oil.

Mite feeding turns the needles yellowish and is first seen at the bases of the branches. Spray with kelthane.

Pieris floribunda Fetterbush, Mountain Andromeda

Fetterbush, an evergreen, grows in sun or partial shade and in a moist, cool, acid soil. The plant grows 2 to 6 feet tall and spreads to 14 feet. It is denser than *P. japonica*. The plant is a little difficult to transplant, grows slowly, needs shelter from winds and needs shade in winter. The flower buds form in the fall and open to white, fragrant flowers in the spring. The plant has limited tolerance to pruning but needs little. Remove the old flowers before seeds form.

Pieris japonica Japanese Andromeda

Japanese andromeda is a broadleaved evergreen shrub that requires a moist, acid soil. The plant should be moved balled and burlapped and is slow to recover after transplanting. The best exposure is partial shade. It will tolerate considerable shade but flowering is reduced. Andromeda grows 4 to 5 feet tall and spreads 6 to 8 feet. The main ornamental feature is the white flowers in terminal racemes. Flowers are sometimes injured by frosts. The new leaves are bronze colored and can be ornamental. Remove the flower heads before seed forms. The plant has a limited tolerance to pruning and grows slowly.

Cultivars include: 'compacta'—compact, leaves smaller than the species; 'crispa'—leaves with wavy margins; 'Dorothy Wycoff'—compact, dark red flower buds, flowers red to dark pink; 'Pinkbud'—buds and flowers pink but fading; 'pygmea'—dwarf; 'variegata'—leaves with white margins; 'Whitecaps'—long flower clusters.

Pieris Diseases

Leafspots can be a problem in rainy seasons. Use a fungicide containing basic copper sulfate.

A dieback occurs when the roots decay. There is no chemical control for this disease.

Pieris Insects

Lacebug causes the leaves to turn yellowish to gray. No chemical control is listed.

Mites discolor the leaves. When heavy infestations occur, fine webbing is visible. Use sprays of kelthane to control mites.

Pinus Mugo Mugo Pine

Mugo pine is a shrub or small tree. It grows best in sun or partial shade and in a deep, moist loam. The plant best recovers from transplanting when moved balled and burlapped. Plant size and density can be controlled by pruning. Mugo pine is a favored host for pine sawfly

and pine needle scale.

Several cultivars are available: 'compacta'—rounded, 3 feet tall; 'Gnome'—about 12 feet tall; 'Hesse'—dwarf; 'mugo'—2 1/2 to 6 feet tall but very broad; 'pumilo'—prostrate.

Pinus Diseases

Cenangium twig blight kills the terminal buds, and needles at the branch tips turn red. Infection is usually limited to the current year's growth. No chemical control is listed. Prune out infected wood and fertilize infected trees to increase their vigor.

Pinus Insects

Pine needle scale causes yellowing and death of heavily infested branches. The scales are white and most obvious on the needles. Dormant oil sprays control overwintering stages and are less harmful to predators that help control scales. Crawlers are controlled with sprays of diazinon, Sevin, malathion or acephate. The preferred method of control involves regularly inspecting plants for early detection of the infestation, then spraying with dormant oil.

Pine sawfly larvae feed on the needles in spring. The insects are an inch long and feed in groups. The caterpillars are dark green and rear back when disturbed. Hand picking or spraying with acephate should control the insects.

Potentilla fruticosa Bush Cinquefoil, Five Finger

Potentilla has small flowers but produces them over a long period of time. The best growing area has full sun and any but a heavy soil. The plant is drought resistant and transplants well but grows slowly. Potentilla is a low, moundlike plant growing 2 to 3 feet tall and spreading the same distance. The yellow flowers are produced from early summer to fall. Rejuvenate the plant with severe pruning every 2 to 3 years.

Cultivars include: 'beesii'—19 inches tall, silver foliage; 'farreri' (Gold Drop)—deep yellow flowers, small leaves; 'friedrichsenii'—flowers creamy white to pale yellow; 'grandiflora'—bright yellow

flowers, can reach 6 feet; 'Maanely's' (Moonlight)—pale yellow flowers; 'mandshurica'—white flowers; 'Mount Everest'—white flowers; 'pyrenaica'—bright yellow flowers, plant 6 to 18 inches tall; 'Snowflake'—white flowers; 'Tangerine'—flowers orange if grown in partial shade, yellow in sun; 'veitchii'—white flowers; 'vilmoriniana'—pale yellow to creamy white flowers.

Potentilla Diseases

Leafspots are usually not common, so controls are seldom necessary. Use basic copper sulfate if needed.

Powdery mildews form a white coating on the leaves. Spray with benomyl or sulfur.

Prunus cerasifera Myrobalan Plum, Cherry Plum

Myrobalan plum is grown for its purple-leaved cultivars. The best sites are sunny with any good garden soil. The tree transplants well but is susceptible to canker diseases. It grows 15 to 30 feet tall and spreads 20 to 25 feet. The growth rate is moderately rapid and frequent pruning may be necessary. The flowers of cultivars are not as ornamental as the colored foliage.

Several cultivars are listed and some should be available at local garden centers: 'diversifolia'—narrow, deeply cut leaves; 'hessei'—shrubby, leaves variegated with crimson; 'Hollywood'—foliage green at first, then deep purple; 'lindsayiae'—pink flowers, 1 inch across; 'nigra'—dark purple foliage; 'Othello'—dark purple leaves; 'pendula'—drooping branches; 'pissardi' (Pissard plum)—very red leaves that hold their color well; 'Thundercloud'—deep purple foliage with good color retention; 'Vesuvius'—large, deep purple leaves, few blossoms.

Prunus glandulosa Flowering Almond, Dwarf Flowering Almond

Dwarf flowering almond grows 3 to 5 feet tall and has white to pale pink double flowers. The flowers are followed by red fruits 1/2 inch

in diameter. The plant needs to be pruned severely after flowering.

Cultivars include: 'alba'—white flowers; 'rosea'—pink flowers; 'albiplena'—double white flowers; 'sinensis'—double pink flowers.

Prunus maritima Beach Plum

Beach plum can be grown in sun or partial shade and a well drained soil. As its name implies, it can be used in beach plantings. It grows 6 feet tall and is rounded and dense with the lower branches often lying on the ground. The white, single or double flowers are 1/2 inch in diameter and are produced in early May. The edible fruit is dull purple to crimson, 1/2 inch in diameter and most ornamental in late summer.

Cultivars include: 'flava'—yellow fruits; 'Eastham', 'Hancock' and 'Premier'—all with large fruit.

Prunus spinosa Sloe, Blackthorn

Sloe grows 15 feet tall, is spiny and may be used as a hedge plant. The white flowers and the blue-black fruit are 2/3 inch in diameter. The fruit is used in sloe gin.

Two cultivars are listed: 'plena'—smaller, double flowers; 'purpurea'—reddish purple foliage, pink flowers.

Prunus tenella Dwarf Russian Almond

Dwarf Russian almond grows 6 feet tall and has white flowers in May. The flowers are 3/4 inch across and the fruit is a red cherry most ornamental in summer.

Cultivars include: 'alba'—white flowers; 'gessleriana'—red flowers, 1 inch in diameter; 'rosea'—pink flowers.

Prunus tomentosa Nanking Cherry, Nankeen Cherry, Manchu Cherry

Nanking cherry can be used in the shade, but it flowers better in sun or partial shade. The plant grows 6 to 10 feet tall with a 15-foot

spread. It transplants well and grows rapidly. The flowers are borne briefly in early spring and are pale pink, fading to white. The red fruits are sour and eaten by birds. The plant is fairly tolerant of pruning.

One cultivar was found listed: 'leucocarpa'—white fruits.

Prunus triloba Flowering Almond

Flowering almond grows best in sun or partial shade and a rich, moist soil. The mature height and spread are 12 feet. It transplants well and grows fairly rapidly. The double, pink flowers appear in midspring. Branches cut in early spring can be forced into bloom. Regular pruning is needed for best performance.

Two cultivars are listed: 'plena'—double flowers; 'multiplex'—double flowers.

Prunus Diseases

Blossom blight and dieback cause brown leaves and wilted branches. Prune out and destroy infected twigs. No chemical control is listed.

Fireblight causes death of individual branches. The leaves on infected branches appear scorched and hang on the branch. There is no chemical control. Prune out the infected branches.

Cankers on the main trunk cause dieback and death when the trunk is girdled. There is no chemical control for this problem. Keep plants healthy with regular fertilization.

Bacterial leafspots dry and drop out, leaving a shot-hole appearance. No chemical control is listed.

Various genera of powdery mildew cause a white coating on the leaves. Use sulfur or benomyl.

Black knot forms black growths on the branches. Prune out infected branches. No chemical control is listed.

Prunus Insects

Aphids suck plant juices and coat leaves with sticky honeydew. Use sprays of diazinon, Sevin, malathion or acephate. The insects can also be

dislodged with high pressure water spray from the garden hose.

Pear slug skeletonizes the leaves. The insect looks like a small, olive green slug. No chemical control is listed.

Tent caterpillars form nests in trees. Burning a nest while in the tree may do more harm than the insects. Accessible nests can be removed by hand. Sprays must be applied with enough pressure to tear and penetrate the nest. Apply sprays when the insects are in or near the nest. Use *Bacillus thuringiensis*, Sevin, malathion, acephate or rotenone.

Prevent borer infestations by keeping trees healthy by fertilizing regularly. Once borers are inside the tree, there is no effective chemical control.

Pyracantha coccinea Firethorn

Firethorn may not be dependably hardy in all situations in Michigan. Some of the cultivars listed are hardier. This is a slow growing, thorny, spreading shrub that needs lots of room. It grows 6 to 7 feet tall and spreads 7 or more feet. A sunny, sheltered location is best, but it tolerates some shade and grows in any well drained soil. Firethorn is hard to transplant except when young. Provide shade in winter to prevent winterburn. The main ornamental feature is the orange to red fruits in autumn. The white flowers are produced in late spring and are not as showy as the fruits.

Cultivars include: 'aurea'—yellow fruit; 'chadwickii'—hardier; 'fructu-albo'—white fruit; 'Kazan' (Kazan Firethorn)—orange-red fruit, hardier; 'lalandi'—more erect, vigorous, less hardy; 'royali'—very vigorous, more hardy; 'wyattii'—good hardiness.

Pyracantha Diseases

Fireblight causes wilting and blackening of shoots. The dead leaves hang on the twigs. There is no chemical control. Prune out infected twigs well below the infected tissue.

Scab causes dark areas on the leaves that turn yellow, then brown, then drop off. No chemical

controls are listed. Rake up and destroy infected leaves.

Pyracantha Insects

Aphids suck plant juices and coat the leaves with sticky honeydew. Use sprays of rotenone, acephate, malathion or Sevin. Di-Syston granules may be used around pyracantha. The insects can also be dislodged with high pressure water spray from the garden hose.

Hawthorn lacebug discolors the foliage and leaves black flecks on the undersides of leaves. Apply Di-Syston granules to the ground around the plant or spray with acephate.

Mites cause yellowish foliage, and heavy infestations form fine webbing. Use kelthane or Di-Syston granules.

Rhamnus frangula Glossy Buckthorn

The best growing area is in sun or partial shade. The shrub has no particular soil preference, transplants well and has a moderate growth rate. The mature height is 8 to 12 feet, with a spread of 6 to 10 feet. The fruits are red, then black but not especially ornamental.

Two cultivars are listed: 'asplenifolia'—leaves cut, rounded; 'columnaris' (Tallhedge Buckthorn)—narrow, upright, useful for screens, requires little shearing.

Rhamnus Diseases

Leafspots can attack buckthorn but are not serious enough to warrant controls.

Various genera of powdery mildew form a white coating on the leaves. Use sprays of benomyl or sulfur.

Rhamnus Insects

Aphids suck plant juices and coat the leaves with sticky honeydew. Use sprays of malathion or rotenone. The insects can also be dislodged with high pressure water sprays from the garden hose.

Scale infestations are controlled with dormant oil in the spring before plant growth begins. Crawlers

are controlled with sprays of Sevin. The preferred method of control involves regularly inspecting plants for early detection of the infestation, then spraying with dormant oil.

Rhododendron

Rhododendron, Azalea

Rhododendrons are ornamental, ericaceous, broadleaved evergreens. Azaleas belong to this genus, but many are not evergreen. They grow best in shade or partial shade. A south or southwest exposure increases the chance of winter injury to evergreen types. Plant in an acid, moist, well drained soil with a pH between 4.5 and 6.5. Several species of azalea and rhododendron are hardy in Michigan. The height and spread depends on the type selected, but some are quite large. Transplanting balled and burlapped or potted plants is most successful. The shallow root systems are easily injured by deep cultivation but benefit from mulching. Remove the old flower clusters as the flowers fade. Plants fail to absorb iron and have yellow leaves with green veins if the soil is not sufficiently acid. Prevent winter burn by avoiding exposed planting sites and by shading during winter.

Rhododendron Diseases

Gray blight infection follows an injury, such as winter injury. A spot, which is at first white with a dark brown margin, forms on the leaf. Protect plants from winter injury. No chemical control is listed.

Dieback is also called *Botryosphaeria* canker. The leaves are attacked near the tips or at the margins; then spots form on the entire leaf. Leaf stalks and twigs are eventually infected. Prune off infected parts. No chemical control is listed.

Leaves infected with *Phytophthora* dieback turn brown, roll, then drop off. The stem shrivels and a canker forms, eventually girdling the stem. Prune out diseased branch tips. No chemical control is listed.

Powdery mildews of various genera form a white coating on the leaves. Use sprays of benomyl or sulfur.

Leafspots may be caused by any number of fungi. Use a spray of basic copper sulfate.

Rhododendron Insects

Black vine weevil and strawberry weevil adults feed at night, notching the leaf margins and making holes in the leaves. The larvae feed on the roots and bark, girdling and killing the plant. Use acephate to control black vine weevil.

Lacebugs cause leaf yellowing. Brown specks on the undersides of leaves are insect excrement. Sunny sites may lead to higher lacebug populations. Use sprays of acephate. Cygon and Di-Syston granules may be used on azalea.

Mites cause leaf discoloration. Use sprays of kelthane. On azaleas, use Cygon or Di-Syston granules.

Scales may be found on branches and stems of unhealthy-looking plants. Use dormant oil in spring. Sprays of Sevin control crawlers. The preferred method of control involves regularly inspecting plants for early detection of the infestation, then spraying with dormant oil.

Rhodotypos scandens

Black Jetbead, White Kerria, Jetbead

Jetbead is not an outstanding ornamental but is tolerant of most light exposures, shade and clay. Jetbead is a little hard to transplant and should be pruned back when transplanted. It grows 3 to 8 feet tall and spreads 4 to 9 feet. The growth rate is moderate and frequent pruning is needed. The white flowers consist of four petals and are produced in midspring, then intermittently through the summer. The seeds are shiny and black and are not readily seen at a distance.

Rhodotypos Diseases

A leafspot may rarely attack this plant. Pick off and destroy infected leaves. Spray with basic copper sulfate.

Twig blight caused by *Nectria cinnabarina* kills the branches. Prune out infected branches.

Rhus typhina

Staghorn Sumac

Sumacs are among the most adaptable shrubs but may be regarded as weeds. They grow rapidly, tolerate most exposures and poor soil but

are short-lived. Sumac grows 30 feet tall and spreads up to 25 feet. The main ornamental feature is bright red fall color. Keep suckers controlled to keep the plant within its allotted space. The red fruits are produced in terminal panicles.

Two cultivars are listed: 'dissecta'—cut leaflets; 'laciniata'—cut-leaved.

Rhus Diseases

Several fungi cause cankers leading to dieback. Fertilize to keep plants healthy and prune out infected parts.

Fusarium wilt infects roots, causing the leaves to droop and wilt. A light infection causes only gradual dwarfing or yellowing and premature red leaf coloration. There is no chemical control.

Leafspot caused by *Pezizella oenotherae* causes gray spots with purplish margins that merge, giving the leaves a scorched appearance. No chemical control is listed.

Various genera of powdery mildew form a white coating on the leaves. Use sprays of benomyl or sulfur.

Verticillium wilt causes wilting of individual stems, followed by death of the foliage. Eventually the entire plant dies. There is no chemical control for the disease. Prune out infected branches. Do not replant in the same spot with sumac or other susceptible plants.

Rhus Insects

Aphids suck plant juices and can be controlled with sprays of Sevin, malathion or rotenone. Acephate may be used on staghorn sumac for aphids. The insects can also be dislodged with a high pressure water spray from the garden hose.

Scales are controlled with dormant oil applied in the spring before plants begin to grow. Sprays of Sevin control crawlers. Acephate also controls crawlers on staghorn sumac. The preferred method of control involves regularly inspecting plants for early detection of the infestation, then spraying with dormant oil.

Ribes aureum

Golden Flowering Currant, Golden Currant

Golden currant is hardy and grows 6 to 8 feet tall and spreads 8 to 12 feet. The shrub transplants well, has a moderately rapid growth rate and forms suckers. It tolerates a range of light exposures and soil types, and shearing, and it is used on difficult sites. The tubular, yellow, fragrant flowers appear in midspring just after the leaves. Dark purple fruits are also produced.

One cultivar is listed: 'praecox'—flowers larger, with petals tipped in red.

Ribes Diseases

Anthrachnose is caused by *Pseudopeziza ribis* and the symptoms are spots on the lower leaves, which then drop. The circular, brown to black spots also form on the fruit and leaf stems. No chemical control is listed.

Dieback or cane blight attacks cause wilting. Prune out and destroy infected tips. No chemical control is listed.

In rainy seasons, leafspots cause premature defoliation. Use basic copper sulfate.

Ribes Insects

Currant aphid causes red, distorted areas on the leaves. Other aphids also infest currants. Spray with Sevin, malathion or rotenone. The insects can also be dislodged with high pressure water spray from the garden hose.

Four-lined plant bug causes round, brown, sunken spots on the leaves. The problem is not serious but is sometimes thought to be a disease. Use sprays of malathion.

Scales of several types may infest ribes. Use dormant oil in the spring before plants begin to grow. Crawlers are controlled with sprays of Sevin. The preferred method of control involves regularly inspecting plants for early detection, then spraying with dormant oil.

Robinia hispida

Rose Acacia, Bristly Locust

Rose acacia is beautiful in bloom but is a potential weed. Plant in a sunny location with dry soil. Suckering can lead to a plant much larger than desired. Rose acacia is 3 to 6 feet tall and spreads 3 to 10 feet. The growth rate is rapid and frequent pruning is needed. The pink flowers are borne in loose, hanging racemes in early summer.

One cultivar is listed: 'macrophylla'—nearly free from bristles, flowers larger.

Robinia Diseases

Leafspots may be seen but are seldom serious. If needed, use basic copper sulfate.

Rubus odoratus

Flowering Raspberry

Flowering raspberry grows best in moist soil and tolerates partial shade. The plant has large leaves and grows 6 to 8 feet tall. The purplish flowers are borne in July. The fruit resembles a red, flat raspberry.

Rubus Diseases

A white coating on the leaves can be caused by several genera of powdery mildews. Use sprays of benomyl or sulfur.

Salix caprea

Goat Willow

Goat willow has large catkins and is often grown as pussy willow. The plant grows 25 feet tall and needs to be cut back every few years. Like most willows, it grows in moist soil.

There are two cultivars listed: 'pendula' (Kilmarnock Willow)—drooping, crooked branches; 'variegata'—leaves marked with white.

Salix Insects

Plants heavily infested with borers have many holes in the trunks and die back. Prevent borer problems by keeping the trees healthy by watering and fertilizing. Infested stems can be pruned out.

Sambucus canadensis

Elderberry, Sweet Elder, American Elder

Elderberry grows best in a sunny, open location and a rich, moist soil. Elderberry grows rapidly, transplants well, tolerates shade and is useful near water. The height and spread are from 5 to 12 feet. The white flowers are produced in early summer in large, flat-topped clusters. The edible, purplish-black fruits, borne in late summer, are attractive to birds.

Cultivars include: 'acutiloba'—leaves cut and divided; 'Adam'—numerous fruits in large clusters; 'aurea'—red fruit, yellow foliage; 'maxima'—flower clusters can be larger than 1 foot across.

Sambucus Diseases

Several cankers can girdle and kill the stems. There is no chemical control.

Leafspots are usually not serious. If needed, use basic copper sulfate.

Powdery mildew causes a white coating on the leaves. Use sprays of benomyl or sulfur.

Sambucus Insects

Stems infested with borers are pruned out.

Schizophragma hydrangeoides

This climbing plant can reach 30 to 40 feet. The sterile flowers in the flower cluster have showy white bracts. Roots produced on the stems attach the plant firmly to supports. The plant is often confused with *Hydrangea petiolaris*.

Shepherdia argentea

Silver Buffaloberry

Silver buffaloberry has silver to gray-green foliage and grows 20 feet tall. The plant may be sheared, has spiny twigs and is dioecious. It tolerates poor soil, dryness, wind, cold and salt. The edible, sour, red berries are covered with interesting silvery scales.

Shepherdia Diseases

Leafspots may rarely be seen. Rake up and destroy infected leaves.

Powdery mildew forms a white coating on the leaves. The disease is hard to detect on the silvery colored leaves. Use sprays of benomyl or sulfur.

Spirea van houttei Van Houtte Spirea

Spirea is a durable and familiar shrub. Best growth occurs in a sunny location and any garden soil. Spirea grows 8 to 10 feet tall, with a spread of 10 to 12 feet. Remove some old wood at each pruning to keep the plant vigorous. The white flowers are produced in spring after the leaves. The plant grows rapidly and may be used as a screen.

Spirea Diseases

Fireblight causes the leaves to appear scorched. The twig tips die back and dead leaves hang on blighted branches. There is no satisfactory chemical control. Prune out infected branches and avoid high nitrogen fertilizer.

A leafspot may infect the leaves. Use basic copper sulfate.

Powdery mildew forms a white coating on the leaves. Use benomyl or sulfur.

Spirea Insects

Spirea aphid causes leaf curling and is usually found on the shoot tips or in flower clusters. Heavy infestations reduce the amount of growth produced by the plant. Use sprays of Sevin, acephate, malathion or rotenone. The insects can be dislodged with high pressure water spray from the garden hose.

Oblique-banded leaf roller rolls and webs the leaves together. Hand pick infested leaves or spray with acephate or Sevin.

Inspect the stems of unhealthy-looking shrubs for scales. Use sprays of dormant oil in the spring to minimize injury to predators that help control scales. Crawlers are controlled with sprays of acephate or Sevin. Identify the scale to properly time crawler sprays. The preferred method

of control involves regularly inspecting plants for early detection of the infestation, then spraying with dormant oil.

Symphoricarpos albus Snowberry, Waxberry

Snowberry grows well in shade, grows rapidly and tolerates clay. The height and spread at maturity are from 3 to 6 feet. A vigorous, suckering root system makes the plant useful on banks. The main ornamental feature is the white fruits, which stay white until the end of December. This dense plant keeps its density even when grown in shade. It may be sheared occasionally and thinned as needed.

One cultivar is listed: 'laevigatus'—large fruit.

Symphoricarpos Diseases

Anthracnose can be caused by two organisms. *Glomerella cingulata* causes brown spots on the fruits, which turn black, then rough, then mummify and drop. *Sphaceloma symphoricarpi* causes dark purplish or black spots on the leaves. The spots have gray centers. The leaves, flowers, fruits and stems may become distorted. The fruits may be shrunken and have a pink discoloration. Prune out infected branches. No chemical control is listed.

Berry rot causes brown, soft, watery fruit. This problem often occurs with anthracnose. No chemical control is listed.

Other leafspots are an occasional problem. Rake up and destroy infected leaves. Use basic copper sulfate.

Powdery mildew covers the leaves with a white coating. Use benomyl or sulfur.

Symphoricarpos Insects

Aphids suck plant juices and coat the leaves with sticky honeydew. Use sprays of malathion, Sevin or rotenone. The insects can also be dislodged with high pressure water sprays from the garden hose.

San Jose scale infests the stems of snowberry. Sprays of dormant oil kill overwintering stages and are less harmful to predators that help control the scale. Sprays of Sevin control the crawlers. The preferred method of control in-

volves regularly inspecting plants for early detection of the infestation, then spraying with dormant oil.

Syringa vulgaris Common Lilac

Lilac is a common flowering shrub that grows best in a sunny location. The plant grows in shade, but flowering is poor and powdery mildew is likely to be severe. Common lilac grows 20 feet tall and spreads 15 feet. The growth rate is rapid and the plant produces many suckers. The flowers are in shades of purple, white or pink. Some colors listed in catalogs refer to the unopened flower buds. Flower bud color may be different from the flower color. There are few actual color variations.

Syringa Diseases

Bacterial blight is most serious on white flowered varieties. The young shoots develop black stripes or one side of the shoot turns black. Spots develop on the leaves, forming a water-soaked blotch. Young leaves turn black and die quickly. On older shoots, the spots enlarge more slowly. The flowers wilt and darken. The disease is worse when wet weather occurs as the new shoots are developing. Thin plants to increase air circulation. Remove and destroy diseased shoots and avoid excessive nitrogen fertilizer. No chemical control is listed.

Phytophthora blight kills stems to the ground. The leaves turn black and shoots have brown lesions on them. No chemical control is listed.

Leaf blotch causes zoned, brown spots. The infected area drops out, leaving a hole in the leaf. No chemical control is listed.

Many fungi cause leafspots. If needed, use basic copper sulfate.

Powdery mildew coats the leaves with white powder. During wet weather, lilacs mildew easily. Mildew is especially severe on shade-grown plants. Spray with benomyl or sulfur. Ignore late season infections.

Verticillium wilt causes wilting and premature leaf drop. The disease may kill one, several or all the branches. There is no chemical control. Try fertilizing with high nitrogen fertilizer.

Bacterial crown gall causes round, warty galls on the stems near the soil line. There is no chemical control. Remove infected plants and do not replant in the same spot.

Syringa Insects

Lilac borer larvae tunnel in the branches, causing wilting. Severely infested branches may break off. Remove and destroy infested stems. Keep plants healthy with regular waterings during dry weather and by fertilizing.

Lilac leafminer tunnels in the leaves in early summer. After mining the leaf, the caterpillars emerge and web leaves together and skeletonize the foliage. Light infestations can be controlled by hand picking. Spray with acephate if the infestation is heavy.

Scales are most often found infesting the lower stems and often blend in with the bark. Inspect unhealthy-looking plants for scale infestations. Spray with dormant oil to control overwintering stages and to minimize injury to predators that help control the scales. Crawlers are controlled with acephate or Sevin. Identify the scale to properly time crawler sprays. The preferred method of control involves regularly inspecting plants for early detection of the infestation, then spraying with dormant oil.

Tamarix hispida Kashgar Tamarix

This tamarix is not as common as other members of the genus and may be more difficult to grow. It grows 4 feet tall and tolerates dry soil. Young branches and leaves are downy. The pink flowers are small but numerous.

Tamarix pentandra Five-Stamen Tamarix, Tamarisk

Tamarisk is a useful plant for its fine-textured foliage and late summer bloom. It grows best in a sunny location and tolerates many kinds of garden soil. This rapid grower transplants well and has a height and spread of 12 to 25 feet. Regular pruning is necessary each spring to induce good flowering. The plant may be used in hedges, but much of the effect of the shape is lost. The small, pink flowers are produced in abundance in late summer. Tamarisk tolerates salt.

Taxus cuspidata Japanese Yew

Japanese yew grows in sun or shade and prefers a moist, sandy loam. Transplanting is most successful with balled and burlapped or potted plants. The species reaches a height of 40 to 50 feet and spreads 15 to 20 feet, but most cultivars are smaller. The plant is dioecious, so the red fruits are produced only by female plants. Female plants have pointed or conical flower buds and male plants have rounded flower buds. Select mostly female plants to get the fruits, but interplant a few males to ensure pollination. Japanese yew dies back in very acid or poorly drained soil.

Cultivars include: 'aurescens'—dwarf, 1 foot tall, spreading to 3 feet, young shoots yellowish; 'densa'—low, about 4 feet tall, spreads to 8 feet, good fruit production; 'expansa'—vase-shaped, open center, twice as tall as wide; 'nana'—a dwarf with good fruiting; 'thayerae'—spreading with almost horizontal branching.

Taxus media Anglojap Yew

Anglojap yew cultivars are some of the most common shrubs in home landscapes. The heights and spreads vary with the cultivar grown. Only the females have ornamental red fruits. Examine the flower buds to purchase mostly female plants.

Cultivars include: 'Amherst'—dense, slow grower, male; 'Berryhill'—slow grower, female; 'browni'—male, rounded habit, dense; 'hatfieldi'—male, dense, pyramidal, can grow 12 feet tall; 'hicksii'—upright, female; 'kelseyii'—female, early fruiting; 'sentenalis'—narrow habit; 'Stoveken'—male, columnar; 'Vermeulen'—slow grower, rounded, female; 'Ward'—wide and flat, female, dense.

Taxus Diseases

Twig blight is caused by several fungi and is worse in rainy seasons. No chemical control is listed.

Taxus Insects

Black vine weevil larvae feed on roots, resulting in needles yellowing. Severe infestations kill the plant. The adults feed at night, notching the

needles. Check needles near the center of the plant for notching. Use sprays of acephate.

Strawberry root weevil is similar in its habits.

Taxus mealybug is 3/8 inch long and covered with a white, waxy coating. The insect sucks plant juices and prefers dense plants. Heavily infested plants have few needles. Spray with acephate or malathion. Dormant oil also controls this insect and is the preferred control.

Fletcher scale is a brown, hemispherical scale that is common on *taxus*. Severe scale infestations cause needle drop. Dormant oil controls overwintering stages of this and other scales. Crawlers are controlled with acephate or Sevin. The preferred method of control involves regularly inspecting plants for early detection of the infestation, then spraying with dormant oil.

Thuja occidentalis White Cedar, American Arborvitae

The white cedar is native in swampy areas in northern Michigan. The tree grows 60 feet tall and spreads 4 to 10 feet. This slow growing tree prefers a moist, rich soil. Transplanting is moderately easy if plants are root pruned and either balled and burlapped or potted. White cedar likes high humidity and tolerates wet soils. The foliage turns brownish in winter, especially on cultivars with colored foliage.

White cedar has given rise to many cultivars, many of which are shrubs. Cultivars include: 'Booth Globe'—low, rounded with a flat top; 'compacta'—dense and compact; 'compacta erecta'—semi-dwarf, pyramidal; 'douglasii pyramidalis'—dense, columnar; 'ericoides'—dwarf, brownish foliage in winter; 'fastigiata'—narrow, columnar; 'globosa'—dense, rounded; 'Hetz Junior'—dwarf, wider than it is tall; 'Hetz Midget'—slow grower, quite dwarf, rounded; 'Hovey'—low and rounded; 'Little Champion'—globe shaped; 'lutea'—yellow foliage; 'pumila' (Little Gem)—rounded, dwarf; 'rosenthalli'—dense, pyramidal; 'umbraculifera'—flat topped; 'wareana'—low and dense, pyramidal; 'woodwardii'—rounded and spreading.

Thuja orientalis Oriental Arborvitae

Oriental arborvitae is less hardy than American arborvitae, but it grows rapidly and transplants well balled and burlapped. The species grows 18 to 25 feet tall and spreads 10 to 12 feet. It tolerates pruning and can be used as a hedge plant. The plant tolerates most soils if they are dry.

Shrublike cultivars are: 'Baker'—light green foliage, said to tolerate hot, dry sites; 'Bonita'—cone shaped, 3 feet tall, leaves with yellow tips; 'globosa'—globe-shaped dwarf; 'juniperoides'—3 feet tall, juvenile foliage needlelike, purplish foliage in fall; 'meldensis'—3 feet tall, narrow, purplish in fall.

Thuja Diseases

Leaf blight causes brown spots on the leaves in late spring. The affected foliage appears scorched, then drops. Use basic copper sulfate.

Juniper blight may attack Thuja. Tip blight is of more concern on *T. orientalis*, especially the golden foliage types. The foliage at the tips of the branches turns brown in late spring or early summer. Use basic copper sulfate.

Thuja Insects

Arborvitae leaf miner mines out the leaf tips, causing them to turn brown. Translucent areas are seen where the miner has been active. Spray with acephate.

Scales of several types infest the stems and foliage. Sprays of dormant oil control overwintering stages. Crawlers are controlled with sprays of acephate or Sevin. The preferred method of control involves regularly inspecting plants for early detection of the infestation, then spraying with dormant oil.

Mites cause yellowing and speckling of the foliage. The mites are seldom noticed because they are so small. Use sprays of kelthane.

Viburnum carcephalum Fragrant Snowball

Fragrant snowball is grown for its very fragrant flowers. The small, white flowers develop

from flower buds tinged with red. The flowers are borne in late May in 5-inch heads. The red and black fruits are produced in early summer. The plant grows 9 feet tall.

Viburnum carlesi Korean Spice Viburnum, Fragrant Viburnum

Korean spice viburnum grows best in a sunny, open location with loose, well drained soil. Transplanting may be difficult and poor growth results from overcrowding or shading. The plant has a moderate growth rate and is 4 to 8 feet tall and spreads 6 to 8 feet. The fragrant flowers are white tinged with pink and are produced in early spring. The fall color is reddish to wine red. Fruits are produced but are usually eaten by the birds.

One cultivar is listed: 'compacta'—more compact growth habit.

Viburnum cassinoides Witherod, Appalachian Tea

Witherod is not as common as other viburnums. It grows best in sun or partial shade and tolerates any garden soil. The plant has a moderate growth rate and transplants well. Mature plants have a height and spread of 5 to 6 feet. The small, white flowers are produced in late spring or early summer. The fruits are produced in late summer or fall. They are at first green, then pink, then blue and finally black. The fall foliage color is red. The plant is valued more for its fruits and fall color than for its flowers.

Viburnum dentatum Arrowwood

Arowwood grows best in sun or partial shade and tolerates any garden soil. The plant grows fairly rapidly and transplants well. The mature height is 6 to 10 feet, with a spread of 6 to 15 feet. The small, white flowers are produced in late spring in 2- to 4-inch clusters. Small, dark blue fruits are produced in late summer and are eaten by birds. The fall color is red to reddish purple.

Viburnum dilitatum
Linden Viburnum

Linden viburnum reaches a mature height of 9 feet. Flat clusters of white flowers are borne in June. The fruits are bright red and persistent. The fall color is red.

One cultivar is listed: 'xanthocarpum'—yellow fruits.

Viburnum lantana
Wayfaring Tree

Wayfaring tree reaches a height and spread at maturity of 12 to 15 feet. The shrub transplants well, tolerates pruning and grows rapidly while young. It tolerates most light exposures, dry soil and high pH. The small, white flowers are borne in flat-topped clusters in mid-to late spring. This is one of the first viburnums to bloom. The fruits are green, flushed with red, then turn black.

Cultivars include: 'aureum variegatus'—leaves marked with yellow; 'burgaeticum'—leaves out early in spring; 'rugosum'—leaves very wrinkled, flower clusters large.

Viburnum lentago
Nannyberry, Sheepberry

Nannyberry tolerates pruning, various light exposures and a range of soil types. It transplants easily and attains a height and spread of 6 to 10 feet. The small, white flowers are produced in flat-topped clusters in late spring. The edible fruits are bluish black in drooping clusters. The plant is red in the fall. The lower branches root where they touch the ground.

Viburnum fragrans (farreri)
Fragrant Viburnum

Fragrant viburnum has fragrant white to pink flowers. The buds are pink and fade to white as the flowers open. The plant grows 12 feet tall and blooms in very early spring. Because it blooms so early, the flowers are often killed by frost. The plant can spread beyond its allotted

space. It has red fruits that are not very ornamental.

Two cultivars are listed: 'album'—white flower buds and flowers; 'nanum'—dwarf growth habit.

Viburnum opulus
European Highbush Cranberry,
European Cranberrybush

European cranberrybush tolerates most light exposures and soil types. It grows rapidly, transplants easily and has a mature height and spread of 12 feet or more. The white flowers are produced in late spring and the red fruit is ornamental from late summer to early fall. The fruit is very distasteful. The plant tolerates pruning and should be thinned occasionally to renew it.

Cultivars include: 'compactum'—5 feet tall; 'nanum'—dwarf, non-flowering; 'Notcutt'—more vigorous; 'roseum'—no fruit; 'sterile' (Guelder Rose, Snowball)—flower heads are round, made up of the larger, sterile flowers, and often infested with aphids; 'xanthocarpum'—yellow fruits.

Viburnum plicatum
Japanese Snowball

Japanese snowball grows well in sun to partial shade and any moist soil. The plant transplants well, has a moderate growth rate and grows to a mature height and spread of 8 to 10 feet. The white flowers occur in ball-shaped clusters produced in late spring.

Cultivars include: 'grandiflorum'—more profuse flowering; 'mariesii'—outer flowers sterile, inner flowers fertile; 'roseum'—flowers open white, then turn pink, may be dependent on growing conditions; 'tomentosum' (Doublefile Viburnum)—interesting horizontal branching is enhanced when the plant bears white flowers in flat clusters; fruit is red, then black and often eaten by birds.

Viburnum prunifolium
Blackhaw, Stagbush

Blackhaw can be grown in sun or partial shade and is more tolerant of dry soil than other viburnums. The plant is 10 to 15 feet tall and spreads 8 to 12 feet. The shrub transplants

well but grows slowly and is often bare at the base. The small, white flowers are borne in late spring after the leaves. The edible fruits are dark blue, oval and held erect. The fall color is deep, dull red.

Viburnum sargentii
Sargent Cranberrybush, Sargent
Viburnum

Sargent viburnum is a large, upright shrub reaching a height of 12 feet. The white flowers are borne in flat clusters in late May. The outer flowers are sterile, large and showy; inner flowers are smaller. The fall color and fruits are red.

One cultivar is listed: 'flavum'—yellow fruits.

Viburnum setigerum
Tea Viburnum

Tea viburnum is 12 feet tall and can be an upright, leggy shrub of poor growth habit. The fruits are red and the fall color is purplish.

One cultivar is listed: 'aurantiacum'—orange fruits.

Viburnum trilobum
Crampbark, American Highbush
Cranberry, American Cranberrybush

American cranberrybush grows in sun or partial shade and in any garden soil. It is a rapid growing, easily transplanted shrub reaching a height and spread of 8 to 12 feet. The white flowers are produced in late spring or early summer, with the larger, sterile flowers at the outside of the cluster. The fruits ripen in August and are red, edible and quite acid. The flavor resembles that of a cranberry. Cultivars selected for their fruiting habit are 'Andrews', 'Hahs' and 'Wentworth'. The fall color is red.

Cultivars with ornamental traits include: 'compactum'—dwarf, about half the size of the species.

Viburnum wrightii
Wright Viburnum

This viburnum can be 9 feet tall. The white flowers are borne in flat clusters in late

spring. These are followed by bright red fruits in the fall. The fall color is reddish.

One cultivar is listed: 'hessei'—about 3 feet tall.

Viburnum Diseases

Bacterial leafspot causes round, water-soaked spots on leaves and young stems. These develop into shrunken, brown areas about 1/8 inch in diameter. Destroy infected leaves and spray with basic copper sulfate.

Bacterial crown gall forms galls on the lower stems. There is no chemical control. Remove infected plants and do not replant in the same spot.

Shoot blight causes grayish to brown decayed spots on the leaves. The spots first appear at the leaf margins, then spread to the rest of the leaf. Infected flower clusters or twigs are killed. The disease is caused by *Botrytis cinerea* and can be controlled with sprays of benomyl.

A number of fungi cause leafspots. If needed, spray with basic copper sulfate. Rake up and destroy infected leaves.

Powdery mildew causes a white powdery growth on the leaves. Spray with benomyl. Sulfur may cause defoliation.

Viburnum Insects

Viburnum aphid is gray to dark green and feeds in clusters at the tips of the branches, causing leaf curl. *Viburnum opulus* is especially susceptible. This and other aphids can be controlled with sprays of acephate, Sevin or rotenone. The insects can also be dislodged with high pressure water spray from the garden hose.

Tarnished plant bug causes brown spots on the flowers and young shoots. The spots have light centers with dark margins. Spray with Sevin.

Treehoppers lay eggs under the bark, then cover them with a white, sticky substance. The white coating is the symptom first noticed. No chemical control is listed for this relatively minor problem.

Inspect the stems of unhealthy-looking plants for possible scale infestations. If found, spray in early spring with dormant oil. Sprays of acephate or Sevin control the crawlers. Identify the scale so crawler sprays are properly timed. The pre-

ferred method of control involves regularly inspecting plants for early detection of the infestation, then spraying with dormant oil.

Weigela florida

Rose Weigela, Old Fashioned Weigela

Weigela grows best in a sunny location and moist soil. Shaded plants are straggly. Weigela also dislikes crowding. The growth rate is moderate and the shrub transplants well, reaching a mature height of 6 to 9 feet and a spread of 9 to 12 feet. Some annual dieback and winter injury make annual pruning necessary. The flowers are white, pink or red, depending on the cultivar.

Weigela Diseases

Bacterial crown gall causes formation of roundish, warty-looking growths on the lower stems. There is no chemical control. Remove and destroy infected plants.

Leafspots sometimes attack weigela and can be controlled with fungicides containing basic copper sulfate. Rake up and destroy infected leaves.

Weigela Insects

Four-lined plant bug makes brown spots on the leaves. The injury is not serious and is often mistaken for a disease. Sprays of malathion or some formulations of Sevin control the insect.

Japanese beetle feeds on weigela. Spray with rotenone, Sevin or malathion. Pesticides may not be effective if beetle populations are high. The grubs in the lawn can be controlled with diazinon or milky spore disease.

Inspect the stems of unhealthy-looking plants to see if scales are present. Overwintering stages can be controlled with sprays of dormant oil. Crawlers can be controlled with sprays of Sevin. The preferred method of control involves regularly inspecting plants for early detection, then spraying with dormant oil.

Wisteria sinensis Chinese Wisteria

Chinese wisteria is a shade-tolerant vine, but it blooms only when grown in the sun. It prefers a deep, rich loam, has a moderate growth rate and may be hard to transplant. The roots may interfere with underground pipes. Pruning is needed to keep this 30-foot vine contained. The violet blue flowers, borne in drooping racemes, are produced in late spring or early summer.

Cultivars include: 'alba'—white flowers; 'Jako'—white, fragrant flowers; 'plena'—double flowers.

Wisteria Diseases

Crown gall causes formation of galls on the main roots or stems. There is no chemical control. Remove and destroy infected plants.

Leafspots may be seen, but infected leaves can be picked off. Basic copper sulfate should control leafspots.

Powdery mildew coats the leaves with a white, powdery growth. Use sprays of benomyl or sulfur.

Wisteria Insects

Black vine weevil may attack wisteria. Use sprays of acephate.

Appendices

PRUNING TIPS

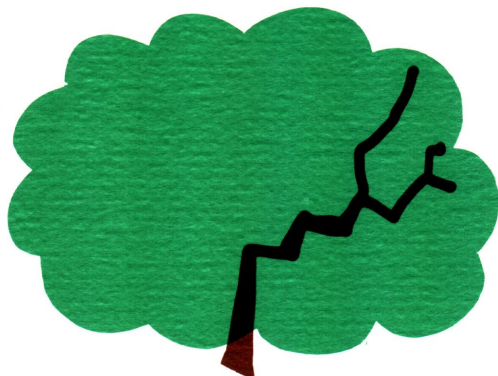
A HELPFUL AID TO CHOOSING SHRUBS

Shade-tolerant shrubs
Shrubs tolerant of shearing
Shrubs or cultivars with summer
 foliage coloration other than green
Shrubs with ornamental fruit
Shrubs with ornamental flowers
Shrubs with summer flowers
Shrubs with ornamental fall foliage color
Evergreen shrubs
Invasive shrubs
Shrubs that may be used as a ground cover
Shrubs for dry sites
Shrubs for moist sites
Shrubs needing an acid soil
Dioecious shrubs

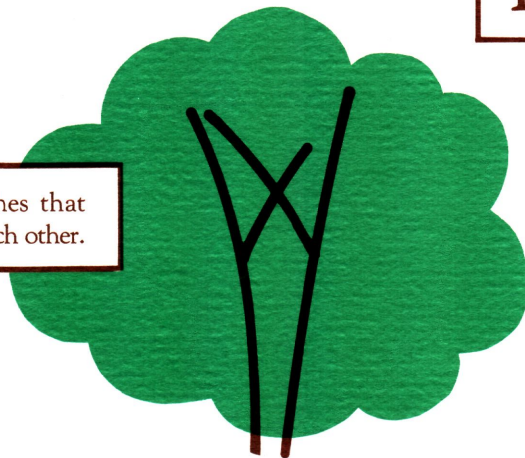
PRUNING TIPS



Don't be intimidated by the prospect of pruning



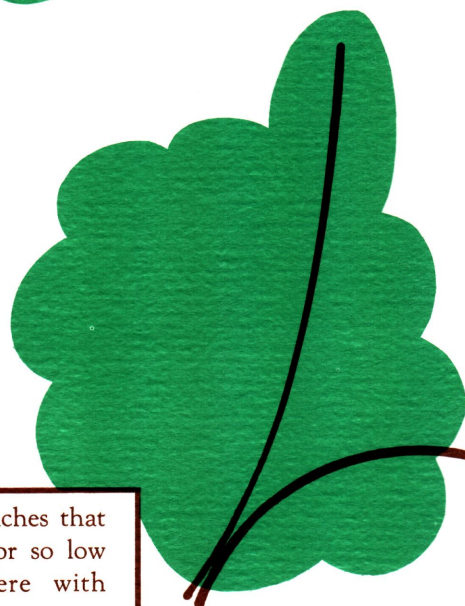
1. Remove dead or diseased branches first.



2. Remove branches that cross and rub each other.

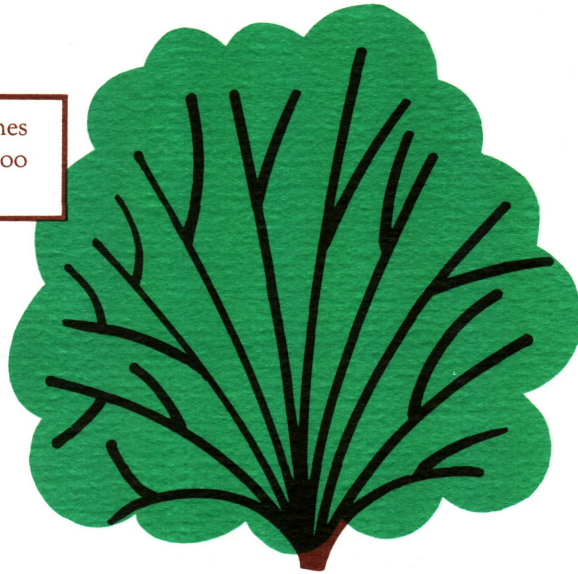


3. Remove branches that do not conform to the shape of the shrub.



4. Remove branches that are too tall or so low that they interfere with mowing.

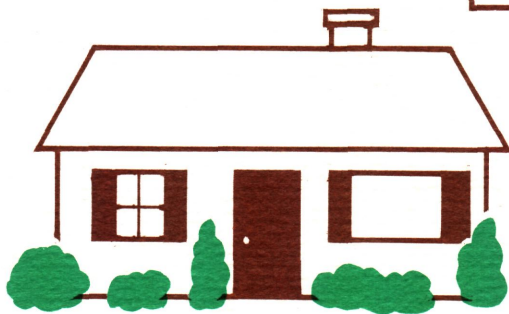
5. Thin out the branches if the shrub is still too thick.



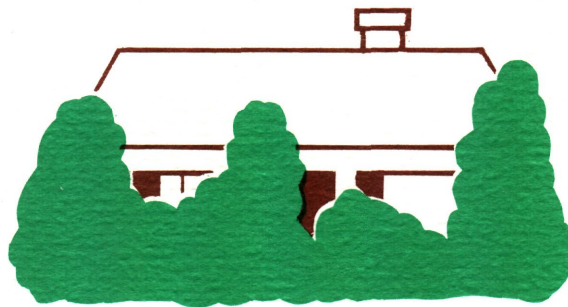
6. Removing the tips of branches at least once a year will make an evergreen become more bushy.



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



8. All shrubs are small when you plant them...



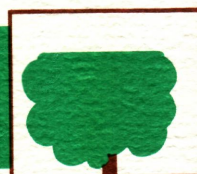
It's how big they will be in 5 years that's important.

A HELPFUL AID TO CHOOSING SHRUBS



SHADE-TOLERANT SHRUBS

Acanthopanax sieboldianus
Calycanthus floridus
Cornus alba
Deutzia gracilis
Euonymus alatus
Euonymus fortunei
Hydrangea arborescens
Hydrangea quercifolia
Leucothoe fontainsiana
Mahonia aquifolium
Philadelphus coronarius
Pieris floribunda
Pieris japonica
Rhododendron
Sambucus canadensis
Symphoricarpos albus
Taxus cuspidata
Wisteria sinensis



SHRUBS TOLERANT OF SHEARING

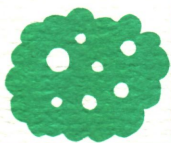
Acanthopanax sieboldianus
Euonymus alatus
Ligustrum vulgare
Ligustrum x vicaryi
Ribes aureum

Taxus cuspidata
Taxus media
Thuja occidentalis



SHRUBS OR CULTIVARS WITH SUMMER FOLIAGE COLORATION OTHER THAN GREEN

Acer palmatum
Berberis thunbergi
Chamaecyparis obtusa
Chamaecyparis pisifera
Cornus alba
Corylus avellana
Cotinus coggygria
Euonymus fortunei
Juniperus chinensis
Ligustrum x vicaryi
Philadelphus coronarius
Picea pungens
Prunus cerasifera
Shepherdia argentea
Thuja occidentalis
Thuja orientalis



SHRUBS WITH ORNAMENTAL FRUIT

Berberis koreana
Berberis thunbergi
Callicarpa dichotoma
Celastrus scandens
Cornus racemosa
Cotoneaster adpressa
Cotoneaster apiculata
Cotoneaster horizontalis
Cotoneaster multiflora
Daphne mezereum
Euonymus europaeus
Euonymus yedoensis
Ilex verticillata
Lonicera tatarica
Mahonia aquifolium
Prunus maritima
Prunus tomentosa
Pyracantha coccinea
Shepherdia argentea
Symphoricarpos albus
Viburnum carcephalum
Viburnum carlesi
Viburnum cassinoides
Viburnum dentatum
Viburnum dilitatum
Viburnum lantana
Viburnum opulus
Viburnum plicatum 'tomentosum'
Viburnum sargentii
Viburnum setigerum
Viburnum trilobum
Viburnum wrightii



SHRUBS WITH ORNAMENTAL FLOWERS

Aesculus pavia
Campsis radicans
Chaenomeles speciosa
Chionanthus virginicus
Clethra alnifolia
Clethra barbinervis
Cornus mas
Cornus officianalis
Corylopsis pauciflora
Corylopsis sinensis
Corylopsis spicata
Cotinus coggygria
Cotoneaster multiflora
Daphne mezereum
Deutzia gracilis
Exochorda racemosa
Forsythia intermedia
Forsythia suspensa
Fothergilla gardenii
Fothergilla major
Fothergilla monticola
Halesia carolina
Halesia monticola
Hamamelis intermedia 'Arnold
Promise'
Hamamelis japonica
Hamamelis mollis
Hamamelis virginiana
Hibiscus syriacus
Hydrangea arborescens
Hydrangea quercifolia
Kolkwitzia amabilis
Leucothoe fontainsiana
Lonicera tatarica
Magnolia Stellata
Mahonia aquifolium

Philadelphus coronarius
Pieris floribunda
Pieris japonica
Prunus cerasifera
Prunus glandulosa
Prunus maritima
Prunus spinosa
Prunus tenella
Prunus tomentosa
Prunus triloba
Rhododendron
Ribes aureum
Robinia hispida
Rubus odoratus
Sambucus canadensis
Schizophragma hydrangeoides
Spiraea van houttei
Syringa vulgaris
Tamarix hispida
Tamarix pentandra
Viburnum carcephalum
Viburnum carlesi
Viburnum cassinoides
Viburnum dentatum
Viburnum dilitatum
Viburnum lantana
Viburnum lentago
Viburnum fragrans
Viburnum opulus
Viburnum plicatum
Viburnum plicatum 'tomentosum'
Viburnum prunifolium
Viburnum sargentii
Viburnum setigerum
Viburnum trilobum
Viburnum wrightii
Weigela florida
Wisteria sinensis



SHRUBS WITH SUMMER FLOWERS

Campsis radicans
Clethra alnifolia
Hibiscus syriacus
Hydrangea arborescens
Hydrangea quercifolia
Potentilla fruticosa
Rubus odoratus
Tamarix hispida
Tamarix pentandra



SHRUBS WITH ORNAMENTAL FALL FOLIAGE COLOR

Berberis koreana
Cotoneaster adpressa
Cotoneaster horizontalis
Euonymus alatus
Fothergilla gardenii
Fothergilla major
Fothergilla monticola
Hydrangea quercifolia
Rhus typhina
Viburnum carlesi
Viburnum cassinoides
Viburnum dentatum
Viburnum dilitatum
Viburnum lentago
Viburnum plicatum 'tomentosum'
Viburnum prunifolium
Viburnum sargentii
Viburnum setigerum
Viburnum trilobum
Viburnum wrightii



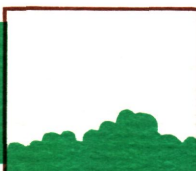
EVERGREEN SHRUBS

Chamaecyparis obtusa
Chamaecyparis pisifera
Juniperus chinensis
Juniperus horizontalis
Juniperus virginiana
Leucothoe fontainsiana
Mahonia aquifolium
Picea abies
Picea glauca 'conica'
Picea pungens
Pieris floribunda
Pieris japonica
Pinus mugo
Rhododendron
Taxus cuspidata
Taxus media
Thuja occidentalis
Thuja orientalis



INVASIVE SHRUBS

Campsis radicans
Rhus typhina
Robinia hispida



SHRUBS THAT MAY BE USED AS A GROUND COVER

Cotoneaster horizontalis
Euonymus fortunei
Juniperus horizontalis



SHRUBS FOR DRY SITES

Acanthopanax sieboldianus
Caragana arborescens
Cotinus coggygia
Juniperus horizontalis
Rhus typhina
Ribes aureum
Viburnum lantana



SHRUBS FOR MOIST SITES

Cornus racemosa
Cornus sericea
Ilex verticillata
Salix caprea
Sambucus canadensis
Thuja occidentalis



SHRUBS NEEDING AN ACID SOIL

Clethra alnifolia
Leucothoe fontainsiana
Pieris floribunda
Pieris japonica
Rhododendron



DIOECIOUS SHRUBS

Celastrus scandens
Chionanthus virginicus
Ilex verticillata
Shepherdia argentea
Taxus cuspidata
Taxus media

A SHORT GLOSSARY

acid soil - Soil with a pH below 7.0.

Bacillus thuringiensis - A species of bacteria that infects and kills some types of caterpillars.

canker - A type of disease characterized by the death of the sapwood. Also a sunken area on a stem caused by the disease. When the disease completely encircles the stem, the part beyond the canker dies.

chelate - A compound that allows iron and other nutrients to be applied in water. Chelates can be sprayed on the foliage.

chlorosis - Leaves turn yellow or yellowish green with dark green veins. Affected leaves are said to be chlorotic.

crawler - The immature, mobile stage of a scale insect life cycle. The stage most vulnerable to pesticides applied during the growing season.

cultivar - A plant that varies from other plants of the species. These variants are usually propagated by budding, grafting or cuttings.

deciduous - A term applied to trees and shrubs that lose their leaves in the fall.

dieback - A type of disease characterized by the progressive death of a plant.

dioecious - Plants that have either all male, or all female, flowers on a single plant. The plants are then said to be male or female, depending on the type of flowers they produce.

dormant spray - A liquid pesticide application made before the plant begins growth in the spring. The two most common materials are dormant oil and liquid lime sulfur.

gall - An abnormal growth caused by an insect or disease.

girdle - An interruption in the flow of water and nutrients in the stem of a plant. Girdling can be caused by animals, diseases, insects or mechanical damage. The portion of the stem above the girdle will die.

interveinal area - The part of the leaf that is between the leaf veins.

monoecious - Plants bear both male and female flowers, but each flower is either male or female.

panicle - A loosely branched flower cluster that is longer than it is wide.

peduncle - The part of a stem that bears a flower or, after the flower, the fruit.

pH - A measure of soil acidity. A pH of less than 7.0 is acidic, above 7.0 is alkaline, and 7.0 is neutral.

raceme - A flower cluster with a long, unbranched stem. The lowest flowers on the stem open first.

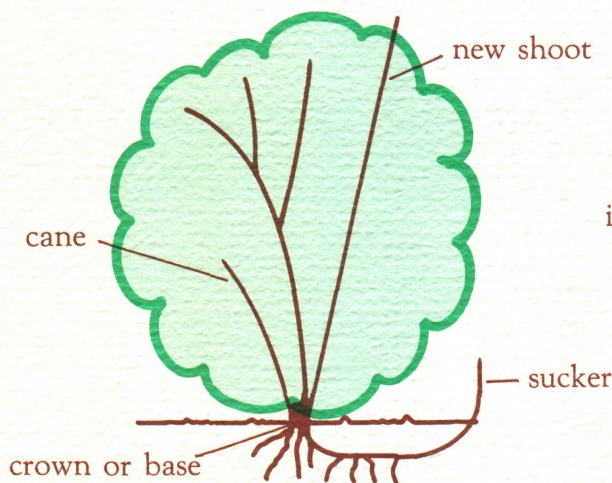
sapwood - The part of the stem where sap movement takes place.

sepal - The floral parts that enclose the flower bud. After the flower opens, the sepals are the usually green, pointed flower parts attached to the stem under the flower.

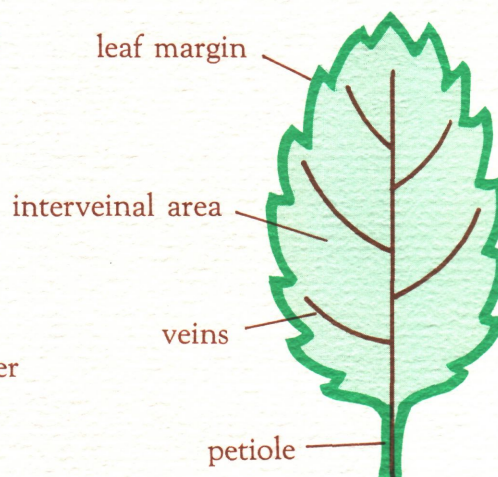
stamen - The male, pollen-producing flower parts. The stamen stem is called the filament; the pollen-producing part at the top of the filament is the anther.

sucker - A stem that grows out of the ground some distance from a shrub. A sucker is often connected to the shrub by an underground stem. A sucker can be dug and used to start a new shrub. Heavy sucker production may be a shrub maintenance problem.

Parts of a shrub



Parts of a leaf



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Selecting Ornamental Plants (free)
Extension Bulletin E-1936
Curt Peterson, Randy Heatley
Available from your local county office of the
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Planting and Care of Ornamental Plants (35¢)
Extension Bulletin E-1947
Curt Peterson, Randy Heatley
Available from your local county office of the
Cooperative Extension Service

Shrubs and Hedges
The American Horticultural Society Illustrated Encyclopedia of Gardening
The American Horticultural Society,
The Franklin Library and Ortho Books

Lilac and Laburnum
Douglas Bartrum
John Gifford LTD

Photographic Manual of Woody Landscape Plants
Michael A. Dirr
Stipes Publishing Company

New Illustrated Encyclopedia of Gardening
T.H. Everett, editor
Greystone Press

How To Recognize Shrubs
William Carey Grimm
Castle Books

Westcott's Plant Disease Handbook
R. Kenneth Horst
Van Nostrand Reinhold

The Marshall Cavendish Illustrated Encyclopedia of Gardening
Peter Hunt, editor
Marshall Cavendish Corporation

Insects That Feed on Trees and Shrubs
Warren T. Johnson and Howard H. Lyon
Cornell University Press

Diseases and Pests of Ornamental Plants
Pascal P. Pirone
John Wiley & Sons

Flowers, A Guide for Your Garden
Ippolito Pizzetti and Henry Cocker
Harry N. Abrams, Inc.

Shrubs and Trees for the Small Place
P.J. Van Melle
The American Garden Guild and Doubleday & Co., Inc.

Manual of Dwarf Conifers
Humphrey J. Welch
Theophrastus

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Issued in furtherance of Cooperative Extension work in agriculture and home economics, acts of May 8, and June 30, 1914, in cooperation with the U.S. Department of Agriculture. W.J. Moline, Director, Cooperative Extension Service, Michigan State University, E. Lansing, MI 48824.

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