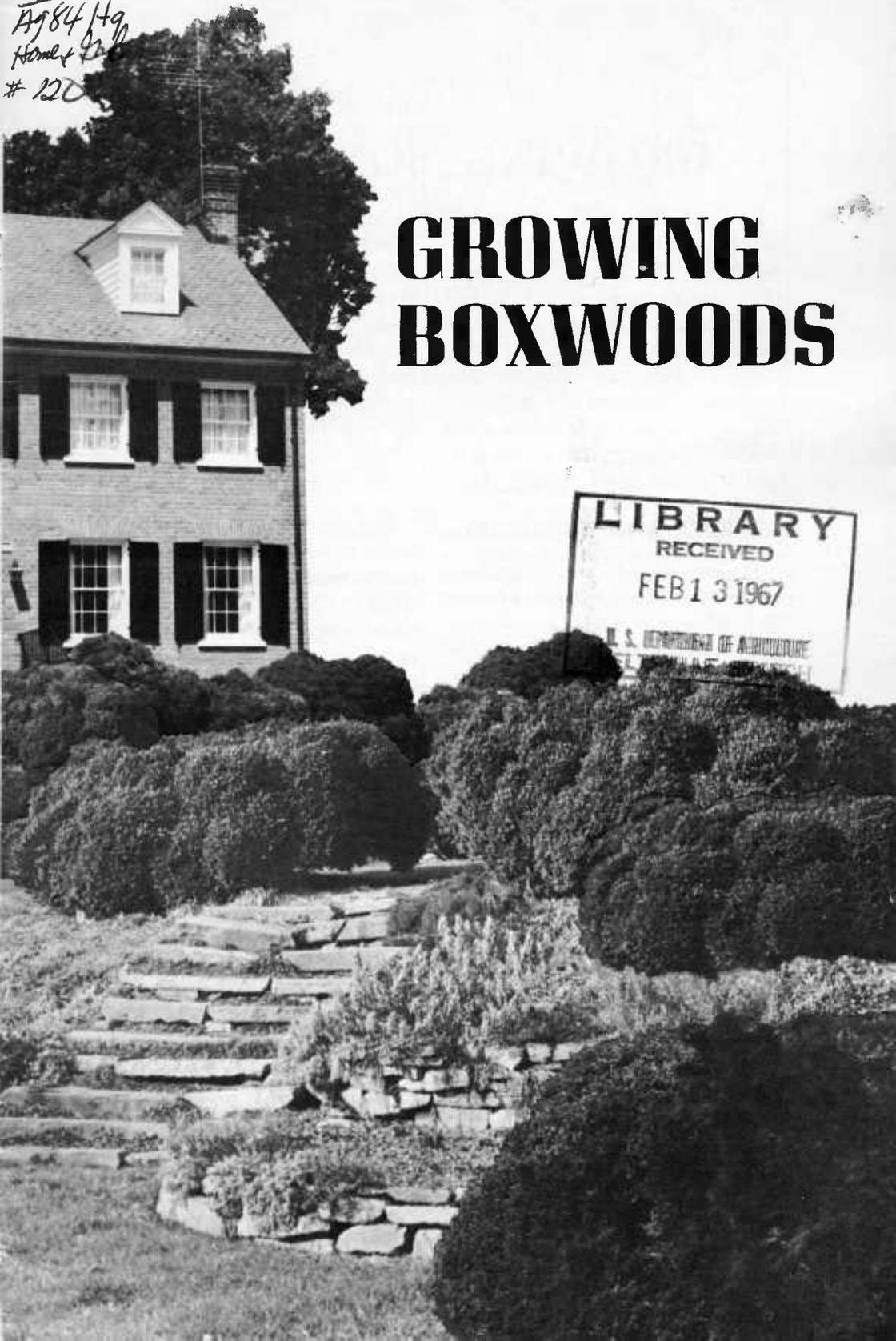


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*Home & Garden*  
*# 120*

# GROWING BOXWOODS

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# GROWING BOXWOODS

Boxwoods have been cultivated in the Middle Atlantic States from colonial times. The center of climatic adaptation for boxwoods is the Chesapeake Bay region and the foothills of the Blue Ridge in Virginia and North Carolina. Fine specimens are also found in the Piedmont of South Carolina, in Tennessee and Kentucky, in the vicinity of Delaware Bay, on Long Island, N.Y., and on the Pacific coast.

## SPECIES AND VARIETIES

The two most widely cultivated boxwood varieties are the English box and the common box. Both are members of the botanical species *Buxus sempervirens*. The English box, or *B.s. suffruticosa*, is a dwarf shrub, often less than 3 feet tall at maturity. The common box, or *B.s. arborescens*, is larger, usually attaining the height of a small tree. Both have standard boxwood characteristics: Dense foliage and full, rounded shapes.

Some other forms of the species *B. sempervirens* are—

- Weeping box—a tall boxwood with drooping branches and wispy foliage. Example: *B.s. pendula*.

- Fastigate box—a narrow, upright type particularly suitable for hedges. Example: *B.s. fastigiata*.

- Variegated box—a shrub that has leaves mottled or bordered with white or light yellow. Example: *B.s. argenteo-variegata*.

Other species of boxwood, in addition to *B. sempervirens*, include *B. balearica*, *B. harlandii*, and *B. microphylla*. Two hardy plants, the Japanese box and the Korean box, are members of the species *B. microphylla*. *B. balearica* plants are somewhat scarce, but the other species are available from nurserymen.

## HARDINESS

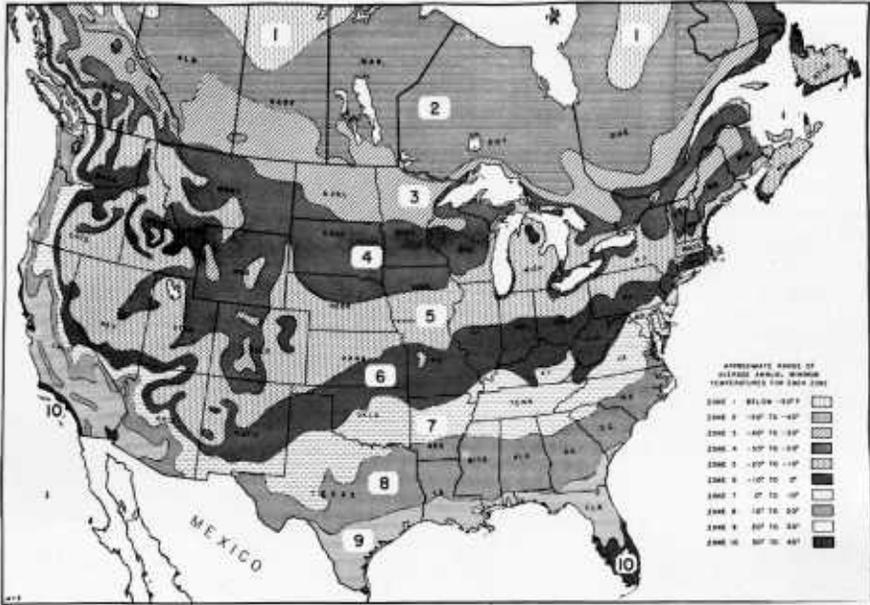
Boxwood varieties differ in their ability to resist cold weather (see plant hardiness zone map, p. 3). Boxwood culture is almost impossible in areas where temperatures drop to  $-10^{\circ}$  F. or lower. The dry, cold winters of the Midwest are unsuitable for boxwood growth.

## SITES AND SOIL

Boxwoods are tolerant of shade and are often planted in heavy shade adjacent to walls or under tall trees. They also do well in full sunlight. An ideal site would provide full sunlight during part of the day and mottled shade at other times.

A wide range of soil types, from sandy loam to heavy clay, are suitable for boxwoods. Soil texture is important only as it influences moisture-holding capacity. Best growth is made in fairly heavy clay that is well supplied with organic matter.

Boxwood soil must be well drained



BN-6914

The USDA plant hardiness zone map. English box and common box can be grown best in zone 7. Japanese box can be grown in zone 6, and the even hardier Korean box can be grown in the southernmost portions of zone 5. Many varieties can be grown in the warm climates of zones 7, 8, and 9, but zones 4 and lower are too cold for any of the boxwood varieties.

and aerated. If the planting site has no natural drainage, boxwoods can be “planted high”; that is, the hole for the root ball can be made shallower than the depth of the root ball. Earth can then be built up around the protruding root ball to provide a sloping surface. This improves drainage around the base of the plant.

Acid soils and lime-rich soils are both satisfactory for boxwoods; the plants thrive in either.

## PREPARATION OF SOIL

If the planting site is suitable for boxwood culture, little preparation of soil is necessary before planting. Make a hole big enough to accommodate the root ball. If the excavated soil is stiff

and lumpy, put it aside and use woods soil or topsoil. If good topsoil is not available, mix bonemeal or commercial fertilizer with the excavated soil.

## FERTILIZING

The boxwood is a heavy-feeding plant and will grow rapidly if liberally fertilized. If its root system is well established, it will make some growth even if soil is of low fertility.

Do not rely on winter mulches to supply all of the nutrients needed by boxwoods. Some boxwoods—particularly trees and large shrubs—may lack vigor if fed entirely by surface mulch. You can prevent this lack of vigor by sprinkling commercial fertilizer around the base of each plant. Use fertilizer



A full, billowing shape characterizes mature boxwood plantings.

grade 10-6-4. Apply 1 to 2 pounds per 100 square feet of soil surface.

Apply fertilizer in late fall just before the ground freezes, or as soon as the ground thaws in the spring. Fertilizing in early fall may delay the maturing of the shoots and may promote second growth, which will be subject to winterkill.

## WATERING

Boxwoods need the equivalent of about 1 inch of rainfall every 10 days. You can be safe in watering plants thoroughly every 10 days from spring to midsummer. Omit watering for 10 days after heavy or prolonged rains.

From midsummer on, water spar-

ingly—every 2 to 3 weeks. If fall weather is dry, water the plants heavily just before the first freezing weather is expected.

If drought persists into the winter, water the plants every 2 to 3 weeks during the winter, whenever the ground is not frozen.

## PRUNING

Boxwood foliage is very dense. Outer shoots should be pruned so that inner shoots can get light and air.

Small shoots should be pruned at their juncture with larger branches. If large branches must be removed, standard precautions should be observed: The cut should be close and



Some of the variation in boxwood leaves: Top, variegated box; bottom left, common box; bottom right, English box.

clean; the bark should be bruised as little as possible; and cut surfaces of a square inch or more should be promptly coated with shellac followed by tree paint.

At least once a year, remove debris (leaves, twigs, etc.) that has accumulated in your boxwoods. Much of it will come out if you shake the bushes vigorously. Pick out the rest. If debris is not removed, it may promote fungus growth.

## TRANSPLANTING

Boxwoods can be transplanted at any time except when they are in active growth or when the ground is frozen.

Root balls should be large and solid. Dwarf boxwoods require a root ball with a diameter at least half the diameter of the top of the plant. Tree boxwoods should have a root ball with a diameter at least one-third the height of the top.

Plants 2 to 3 feet high or broad should be shaded for a year after transplant. A lattice that cuts off about half the light should be used. Shading is especially important if the plants are moved from a partly shaded to an exposed site. The lattice should clear the foliage by 10 to 18 inches and should protect at least the sunny sides as well as the top of the plant.

Newly transplanted boxwoods must be watered thoroughly and regularly. Direct a slow flow of water underneath the crown to the trunk. Continue watering until the root ball is wet all the way through. Build a low ridge of soil around the root ball to prevent wasting water and to allow thorough wetting.

## WINTER PROTECTION

In areas ideally suited for boxwood culture, a mulch of wood chips, leaf mold, or similar material provides adequate protection to boxwood plants during the winter. A mulch protects by preventing rapid temperature change at the soil surface, deep penetration of frost, and excessive loss of surface water.



ST-852-12

**Boxwoods may need winter covers. In mild climates, pine branches placed along the north side of hedges will provide adequate protection.**

Additional protection is needed in areas where the winter temperature is likely to be colder than 20° F. In these areas, some covering is necessary for the top of the plant.

The covering can be made of burlap, a section of snow fence, or any other material that will protect the top, yet permit air circulation around the plant. The foliage should not rub against the covering.

Do not put the cover on until the ground surface freezes; take it off as soon as the risk of temperatures colder than 20° F. is past. Mild frosts after removal of covers do little harm.

## DISEASES

Diseases of boxwoods can be divided into three classes: Those that attack the leaves, those that attack the stems

and branches, and those that attack the roots. All of these diseases are caused by fungi.

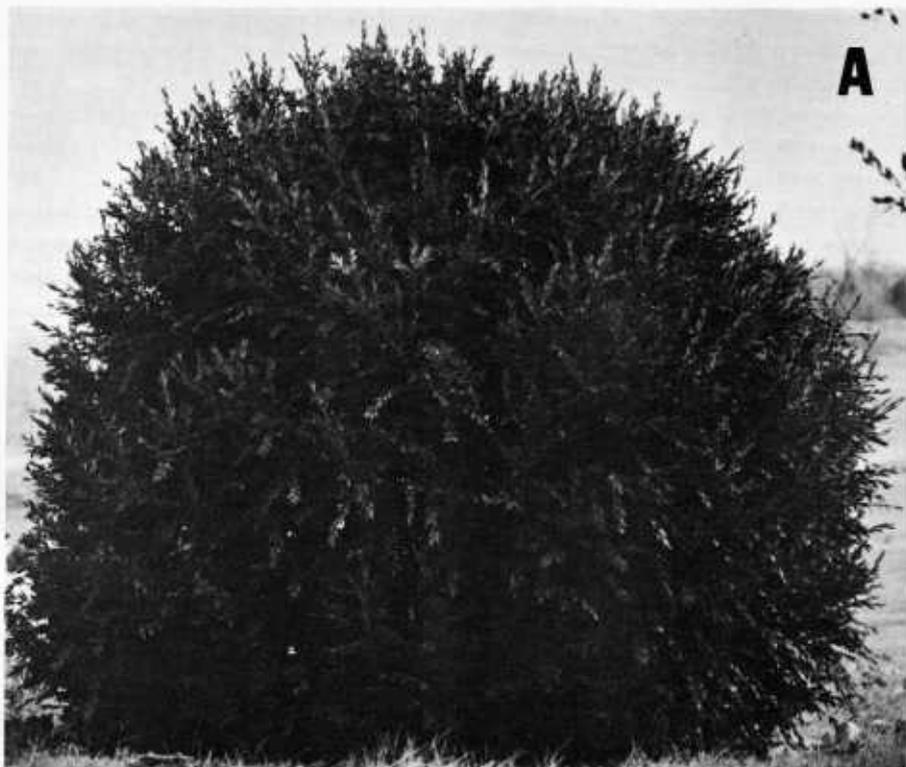
Leaf diseases result in spotted or discolored leaves. Fungus pustules usually appear on the leaves. Leaf diseases can be controlled by spraying from one to four times with Bordeaux mixture. The first spray application should be made in the spring, before plant growth begins; the second, when new growth is about half completed; the third, about 3 weeks after the second; and the fourth, in the fall after growth has ceased.

Some symptoms of stem disease are loss of color in the leaves, development of spore pustules in the bark, and loosening and peeling of bark. Most stem diseases can be controlled by pruning the diseased parts or gouging out the diseased areas. Pruning should



Snow accumulation sometimes breaks down the branches of small boxwood shrubs.

This means of support—cords strung along the sides and crisscrossed through the interior of shrubs—helps prevent such damage.



Boxwoods grow in a variety of forms. Pictured on these pages are:

*A*, a common, or "tree" box. This one is about 5 feet tall; the common box may grow to a height of 30 feet.

*B*, a weeping box, with drooping branches and wispy foliage.

*C*, a variegated box; the leaves are edged with pale, yellow-green markings.

*D*, a boxwood with extreme fastigate (columnar) characteristics.

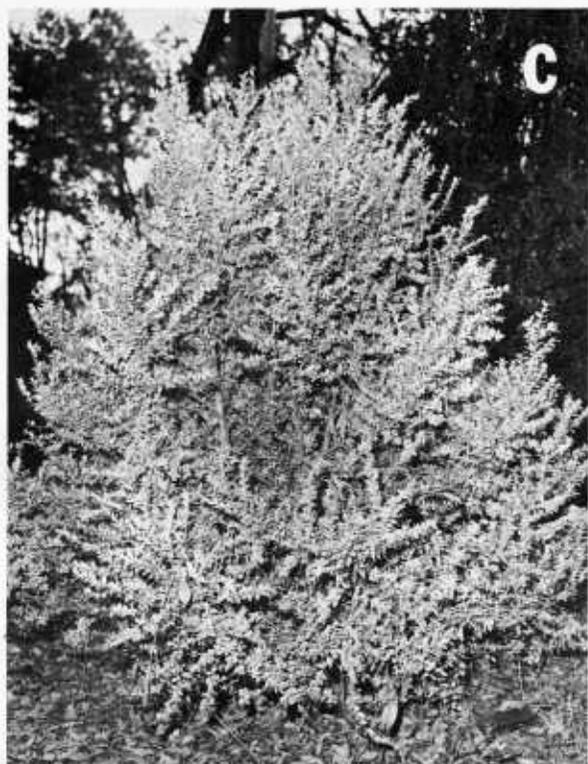
*E*, a typical planting of young English box.

The two most widely cultivated boxwood varieties are the common box and the English box. They have been grown in the Middle Atlantic States since colonial times, and their range now extends westward to the Pacific coast (see zone map).



ST-853-2, ST-851-0, BN-26969

The other boxwoods pictured are a few of the many horticultural varieties that have been named by nurserymen. Formal classification of boxwood is difficult. Consequently, a given variety may have different names in different nurseries.



be done before humid summer weather arrives and promotes further growth of fungus spores. As a preventive measure, remove all debris from the interior of the plant. Shake bushes vigorously and go over them with a broom or vacuum cleaner.

Root rot affects many plants in addition to boxwood, and is very difficult to control once it becomes established. Good cultural practices will help pre-



*A*, leaf fungus. *B*, twig fungus. Fungi usually develop only on weak or injured plant parts.

vent infection. Good drainage around the roots is especially important. If boxwoods die of root rot, the roots should be dug up and the soil sterilized before new trees are planted.

## INSECTS AND RELATED PESTS

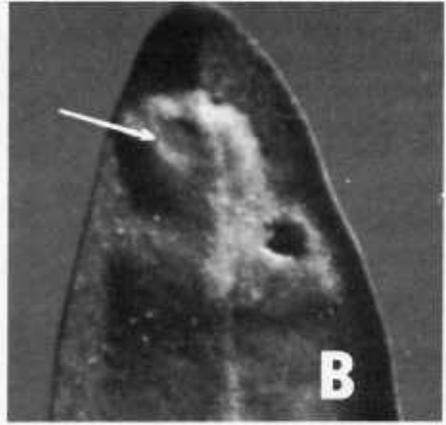
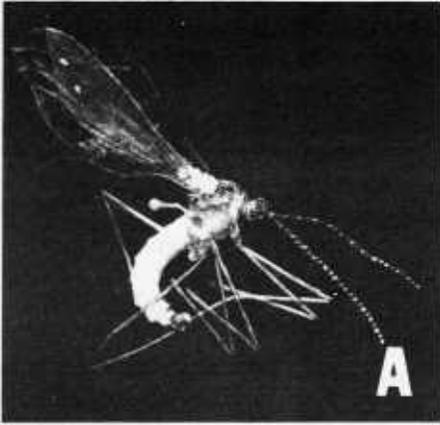
The principal pests of boxwoods are the boxwood leaf miner, the boxwood psyllid, the boxwood mite, and oystershell scale. Pesticides named in the accompanying spray schedule kill pests present in old foliage and protect new foliage from infestation. Local conditions may influence spraying requirements; if you want advice about spraying, get in touch with your county agricultural agent.

### Boxwood Leaf Miner

The boxwood leaf miner is the larva of a small gnatlike fly. In spring, the flies inject their eggs into the young boxwood leaves. Larvae from the eggs develop slowly during the summer, hollowing out areas inside the leaves as they feed. They winter inside the leaves.

The larval, or feeding, stage of the life cycle is completed late in April or early in May. The pupal stage follows; it lasts about 10 days. During this stage, the larvae turn to pupae. The pupae break through the surfaces of the leaves and work themselves part-way out. The adult flies then emerge from the pupae.

This insect is easily controlled with properly-timed applications of DDT. To determine the right time to apply DDT, watch the development of the



FI 6399, FI 1740, FI 3692, FI 6398

*A*, the orange-colored adult, or fly, of the boxwood leaf miner. *B*, a miner-infested leaf; the arrow points to the thin spot through which the adult fly will emerge. *C*, leaf miner maggots, exposed by removing the surface membrane of the leaf. *D*, pupal skin hanging from the undersurface of the leaf. The adult fly has emerged from the skin.

pupae. Every 2 or 3 days during the pupal period, break open a leaf and examine the pupae. A pupa's head and wing pads turn dark brown near the end of the pupal period—just before the adult fly emerges from the leaf. This is the time to apply DDT.

### Boxwood Psyllid

The adult boxwood psyllid is a grayish-green sucking insect about  $\frac{1}{8}$  inch long. In its preadult (nymph) stage, the psyllid feeds on leaves and causes the characteristic leaf-cupping deformity on young spring growth. The nymph also excretes a white waxy substance. In late May and early June the nymphs become adults. The



FI 17408

Boxwood foliage infested with psyllids. Note the excreted white material and the cupping of leaves.

adults feed 6 to 7 weeks, then deposit their eggs at the base of overwintering buds. The eggs hatch between August and October.

The newly hatched nymphs are oval, legless, and scalelike in appearance. They feed by inserting their thin, hair-like mouth parts into the live tissues of the plant and hibernate in this stage under the bud cover. In spring, usually about mid-April, they molt, grow legs, and crawl to new leaves to feed. Spray according to directions in the accompanying spray schedule.

### Boxwood Mite

The boxwood mite is found in most boxwood plantings. The adults are yellowish green to reddish brown and about  $\frac{1}{64}$  inch long. Eight or more generations may be hatched during the spring, summer, and fall. The last generation to mature in the fall lays eggs that remain dormant during the winter and hatch in mid-April.

Newly hatched mites feed first on adjacent leaf tissue, then move from leaf to leaf. The adult mites feed mostly on tender shoots and on the upper surfaces of leaves. Leaves at first show tiny scratchlike markings; later they become bronzed and withered, and sometimes drop to the ground. Dicofol (Kelthane) and dimethoate, applied as recommended in the accompanying spray schedule, will control most mite infestations. If infestations are extremely heavy, spraying frequency may be increased to once every 2 weeks.

### Oystershell Scale

Oystershell scale attacks many kinds of plants. This scale has a covering

## Spray Schedule for Boxwood Pests

### FIRST SPRAYING

[Apply as soon as plants resume growth in spring; kills leaf miner larvae, scale insects, and young psyllids]

	Pesticide, <sup>1</sup> formulation, <sup>2</sup> and strength	Amount to mix with 1 gallon of water
Apply one:		
Lindane: EC, 20 percent	-----	1 teaspoon.
or		
Lindane: WP, 25 percent	-----	1 level tablespoon.
or		
Dimethoate: EC, 23.4 percent	-----	2 teaspoons.
or		
Summer oil: EC, 100 percent	-----	5 tablespoons.

### SECOND SPRAYING

[Apply between May 1 and May 15, or when head and wing pads of leaf miner pupae turn brown; kills adult leaf miners, psyllids, and mites. Repeat treatment in 7 to 10 days]

Apply one:

A combination of—

DDT: EC, 25 percent----- 1 tablespoon.

Dicofol (Kelthane): EC, 18.5 percent----- 1 teaspoon.

or

A combination of—

DDT: WP, 50 percent----- 2 level tablespoons.

Dicofol (Kelthane): EC, 18.5 percent----- 1 teaspoon.

### THIRD SPRAYING

[Apply June 15; kills young leaf miner larvae, psyllids, mites, and oystershell scale crawlers. Repeat August 15 for scale]

Dimethoate: EC, 23.4 percent----- 2 teaspoons.

<sup>1</sup> Lindane and DDT are insecticides; dicofol is a miticide; dimethoate is both an insecticide and a miticide.

<sup>2</sup> EC=emulsifiable concentrate; WP=wettable powder.

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shaped like an oyster. The covering is brownish gray,  $\frac{1}{8}$  inch long, and  $\frac{1}{16}$  inch wide. The scale itself is yellow and soft bodied.

Scale eggs pass the winter under the coverings of female scales. The eggs hatch in May or June, and the nymphs become adult scales by mid-July. The adults mate and produce another generation.

If large numbers of scales build up, severe stunting or death of infested branches may result. Prune heavily encrusted branches before spraying. Apply spray as directed in the accompanying spray schedule. In addition, apply a dormant oil emulsion before plant growth begins in the spring. Follow the directions on the container label.

## NEMATODES AFFECTING BOXWOODS

Boxwoods are attacked by several species of plant-parasitic nematodes, the most common of which are root-knot nematodes, root-lesion nematodes, and spiral nematodes.

### Damage

Root-knot nematodes enter the roots and cause the root swellings, or galls, that are usually called root-knot. When infections are severe, plants become stunted, foliage turns yellow, and leaves fall. The plants may eventually die.

Root-lesion nematodes enter the root cortex and kill the cells on which they feed. The damaged tissue is invaded by bacteria and fungi, and the roots rot. This stimulates formation of new lateral rootlets above the dead area, which in turn are invaded by the nematodes. The result is an excessively branched root system with the individual roots rotted or partly rotted.

Spiral nematodes feed with their heads imbedded in the root tissue. Cells of the root cortex are killed and adjacent cells are affected by a substance secreted by the nematodes. The result is an open wound that may be invaded by bacteria and fungi.



ST 851-11

Healthy boxwoods have dense, lush foliage. Above, one of the specimens of common box at Blandy Experimental Farm, Boyce, Va.

If the roots are seriously damaged by nematodes the plant will be unable to get food and water, and will appear sickly even when heavily watered and fertilized.

Because nematodes are too small to be seen without magnification, and because a number of other ailments cause similar symptoms, nematode infestation is difficult to determine.

## Treating Infested Plants

The chemical 1,2-dibromo-3-chloropropane (DBCP) has been used with some success.

**CAUTION:** This chemical may kill boxwoods if too much is applied. Follow the manufacturer's directions carefully.

Emulsifiable formulations of DBCP are the most convenient. Bank up the earth to form a basin around the plant, then pour the chemical, mixed with water, into the basin. Use enough water to distribute the chemical evenly over the area of the basin. Add enough water to fill the basin to a depth of at least 3 inches. The chemical is effective only if enough water is used. The water carries the chemical down around the roots.

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Trade names are used in this publication solely for the purpose of providing specific information. Mention of a trade name does not constitute a guarantee or warranty of the product by the U.S. Department of Agriculture or an endorsement by the Department over other products not mentioned.

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Do not apply DBCP when plants are in active growth. The best time of year for application is spring or early fall. Soil temperature at a depth of 6 inches should be between 40° and 80° F. during application.

One treatment does not kill all nematodes. Repeat the treatment as nematode populations rebuild, but do not repeat it more frequently than once a year.

Before replacing a nematode-damaged plant, treat the soil with DBCP or some other nematode killer. Examine the roots of the replacement plant for nematode damage. Do not buy nematode-infested plants. Such plants seldom thrive, even in fumigated soil.

## PRECAUTIONS

Pesticides used improperly may cause injury to man and animals. Use them only when needed and handle them with care. Follow the directions and heed all precautions on the labels.

Keep pesticides in closed, well-labeled containers in a dry place. Store them where they will not contaminate food or feed, and where children and animals cannot reach them.

When handling a pesticide, wear clean, dry clothing.

Avoid repeated or prolonged contact of pesticide with your skin.

Wear protective clothing and equipment if specified on the container label. Avoid prolonged inhalation of pesticide dusts or mists.

Avoid spilling pesticide concentrate on your skin, and keep it out of your eyes, nose, and mouth. If you spill

any on your skin, wash it off immediately with soap and water. If you spill it on your clothing, launder the clothing before wearing it again.

After handling a pesticide, do not eat, drink, or smoke until you have washed your hands and face. Wash any exposed skin immediately after applying a pesticide.

DDT and dicofol can be used safely without special protective clothing or devices, provided they are in diluted water-spray form.

Dimethoate and lindane can be absorbed directly through the skin in harmful quantities. When working with these insecticides in any form, take the same precautions as with concentrates.

Avoid drift of pesticide to nearby wildlife habitats, bee yards, crops, or livestock.

To protect water resources, fish, and wildlife, do not contaminate lakes, streams, or ponds with pesticide. Do not clean spraying equipment or dump excess spray material near such water.

Do not apply pesticides to plants during hours when honey bees and other pollinating insects are visiting them.

Dispose of empty pesticide containers at a sanitary land-fill dump, or crush and bury them at least 18 inches deep in a level, isolated place where they will not contaminate water supplies. If you have trash-collection service, wrap small containers in heavy layers of newspapers and place them in the trash can.

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*Use Pesticides Safely*  
**FOLLOW THE LABEL**  
U.S. DEPARTMENT OF AGRICULTURE

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