



GROWING BOXWOODS IN THE LANDSCAPE

Erv Evans, Extension Horticulture Associate
 Richard E. Bir, Extension Horticulture Specialist
 Stephen Bambara, Extension Entomology Specialist

Boxwoods have been an important part of North Carolina landscapes since colonial times; the first plants were introduced to American gardeners in 1652. Boxwoods are suitable for formal and informal landscape use as edging, hedge, screen, accent, and specimen plants. While boxwoods are considered an essential component of historical and colonial gardens, they can also be used in traditional and contemporary landscape designs.

Culture

Boxwoods will grow in full sun, but they prefer a partially shaded site. Fertile soil is not essential but the soil should be limed to a pH of 6.5 to 7.0. Avoid windy sites such as corners of buildings or crest of hills where winter wind injury (bronzing) can be expected. A well-drained soil is essential to avoid root disease problems. Boxwoods should not be planted near downspouts or areas that stay wet. The planting hole should be at least twice as wide but only as deep as the root ball. The plant should be set at the same depth it grew in the nursery; deep planting can cause an initial loss of plant vigor and possibly eventually plant death.

Newly transplanted boxwoods should be watered weekly during dry summer weather until they become well established (two years or more may be required in eastern North Carolina). A 2- to 3-inch layer of an organic mulch, such as pine straw or pine bark, is helpful in keeping roots cool and

moist. The mulch should extend at least 12 inches beyond the foliage canopy. Check the mulch depth annually, and replenish to maintain the desired depth. Excessive mulch is not desirable since the plants' roots will tend to grow in the upper strata of soil or in the mulch layer (instead of the soil) causing the plant to be damaged during drought periods. Boxwoods are shallow rooted shrubs and will need watering during extended drought periods. If there is a deficiency of late fall or winter rain, the plants should be watered prior to freezing weather to reduce the possibility of winter bronzing.

Ideally, fertilization should be based on a soil test. However, if a soil test is not conducted, apply a balanced fertilizer such as 10-10-10 at the rate of 1 lb (1 1/2 cups) per 100 ft² in late winter or early spring before new growth occurs. Distribute the fertilizer uniformly over the planted area but not closer than 6 inches from the plant stem. Sandy and particularly infertile soils should receive a second application of fertilizer in late spring. Avoid late summer fertilization, because it can stimulate growth which is susceptible to frost or cold damage.

Prune to remove diseased, injured, dying, or dead branches. Pruning can be done to shape plants and increase density any time of the year except six weeks before the average date of the first frost in the fall. Many gardeners use the foliage as decorations for the holidays—little additional pruning may

Distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914. Employment and program opportunities are offered to all people regardless of race, color, national origin, sex, age, or disability. North Carolina State University, North Carolina A&T State University, U.S. Department of Agriculture, and local governments cooperating.



**North Carolina
 Cooperative Extension Service**
 NORTH CAROLINA STATE UNIVERSITY
 COLLEGE OF AGRICULTURE & LIFE SCIENCES

be needed. As plants age, some of the oldest branches may need to be removed to allow light to reach the inner shoots. Continuous shading of the inner shoots results in foliage drop from those shoots. Most boxwoods are slow to respond to severe pruning. If severe pruning must be undertaken, do so in late winter to early spring. It may take the plant years to recover. A regular program of light to moderate pruning is preferred.

Popular Selections

Three species comprise most of the boxwoods planted in the United States. However, more than 160 registered boxwood cultivars exist. Cultivars are usually chosen for introduction because they vary from the species in size, form, texture, leaf color and shape, insect or disease resistance, or climatic adaptability. Boxwoods flowers are inconspicuous; plants are normally grown for their foliage.

The most commonly grown boxwoods in North Carolina landscapes are American and English boxwoods. However, in recent years many new selections have appeared which display a variety of forms and superior tolerance to winter injury. These newer cultivars are proving excellent choices for piedmont and mountain landscapes but have not been extensively evaluated in the coastal plain. Some of the more widely grown boxwoods include the following:

Japanese boxwood, *Buxus microphylla* var. *japonica* (Muell.) Rehd. & Wils. is hardy to USDA Zone 5. It has been grown in the United States since about 1890 and is the most adaptable of all boxwoods. Leaves are glossy, 1/2 inch wide by 1 inch long, have medium green color when grown in shade and often develop orange to bronze color in sites with winter sun. This variety flowers and seeds freely. It is an open, quick-growing shrub which can be 8 ft tall and 20 or more ft wide. Plant width is often difficult to determine because of naturally occurring layering. Japanese boxwood and most of its cultivars are heat tolerant.

Buxus microphylla 'Compacta' is hardy to USDA Zone 5. First distributed by Kingsville Nursery in Maryland and sometimes sold as 'Kingsville Dwarf,' it is the smallest of all boxwoods (about 1 ft tall), averaging 1/2 inch of new growth per year. Leaves are 1/2 inch long by 1/4 inch wide, making it popular as a bonsai plant.

Common or American boxwood, *Buxus sempervirens*, L. is hardy to USDA Zone 5. This boxwood is a wide-spreading shrub or small tree with very dense evergreen foliage. The leaves are oblong-lanceolate to oval in shape, 1/2 to 1 1/2 inches long and are broadest at or below the middle. Leaves are usually shiny, dark green on the upper surface and pale green on the lower surface. Flowers, borne in early spring, are pale green. They commonly grow 5 to 10 ft tall. Old plants may attain a height of 20 ft. This species and most of its cultivars are tolerant of cold weather. They are well suited for the piedmont and mountain areas of North Carolina.

English or true dwarf boxwood, *B. sempervirens* 'Suffruticosa,' is hardy to USDA Zone 5. It is the most popular and most widely grown cultivar of all boxwoods, predating 1753 in the United States. It is a low (often less than 3 ft), slow-growing, compact shrub which rarely averages more than an inch of growth annually. The plant is rounded with tufts that resemble a cloud.

B. sempervirens 'Vardar Valley' is currently the most popular of the *B. sempervirens* collections made in Macedonia in 1934. It is considered to be among the hardiest of *B. sempervirens* available. It is popular because it retains dark green color in winter. Spring growth has a bluish cast. 'Vardar Valley' has a broad spreading habit and reaches a height of 7 ft.

B. sinica var. *insularis* 'Wintergreen,' a selection of Korean boxwood, is hardy to USDA Zone 4. It originated in 1960. This slow growing cultivar's foliage has a dark green color that lasts through the winter. It displays a more open habit than American boxwood and is a heavy seed producer. A 16-year-old plant may be 5 ft tall by 3 1/2 ft wide.

Buxus 'Green Mountain' is hardy to USDA Zone 4b. Introduced by Sheridan Nurseries of Canada in 1966, it also has dark green foliage color that persists through winter. It displays a dense pyramidal habit. A 10-year-old plant may be 3 ft tall by 1 1/2 ft wide. Ultimate size is anticipated as 5 ft tall with a base 3 ft wide.

Buxus 'Green Velvet' is hardy to USDA Zone 4b. It's a 1973 Sheridan Nurseries hybrid introduction with a rounded habit and vigorous growth which holds color well through winter. Ultimate height is anticipated as 4 ft.

Propagation

Boxwood can be propagated from semi-hardwood or hardwood cuttings. The best time for rooting is from late summer through fall. Cuttings should be taken from healthy, vigorous plants that are insect and disease free. Make the cuttings 5 to 6 inches long. Those of highest quality are from terminal growth. Remove the leaves on the lower 2 inches before inserting the cuttings in the rooting media. The media can be sharp builder's sand or equal parts of peat and perlite or peat and sand.

Potential Plant Problems

Winter injury (bronzing) — Boxwood foliage color may become orange, yellowish, or reddish-brown in the winter if exposed to winter sun, frequent frost, and wind. Bronzing can be significantly reduced or avoided by planting in a shaded site protected from harsh winter winds. An alternative is to provide protection from winter wind and sun by using a wind break or cover. Plants under stress due to low pH, low fertility, or drought are more likely to develop winter bronzing. Bronzing can also be caused by nematode infestations. Bronzing will not kill the plant but can reduce the plants overall attractiveness. New foliage in the spring should develop normal green color. Bronzing is a normal occurrence on Japanese boxwood in winter.

In mild winters, dormant plants that are exposed to direct sun may begin premature cambial activity. Subsequent freezing weather may injure or kill the new tissue, and sometimes cause the bark to freeze and separate from the wood.

Boxwood leafminer — This is the most common insect pest of boxwoods in North Carolina. It is a greater pest in the mountains and piedmont than in the coastal plain. All boxwoods can be infested but slow-growing cultivars are less susceptible. Infested leaves develop yellowish blotches and are smaller than uninfested leaves.

Leaves first acquire a water-soaked appearance at the feeding site followed by blisters on the lower leaf surface. Leafminers spend the summer and winter in the blisters as larvae. The larvae are small, whitish to lemon-yellow maggots up to 3 mm in length. Larvae pupate in early spring and wiggle through the leaf in May to protrude from the lower leaf surface. In North Carolina, adult flies emerge from the pupae over a two week period in the

spring, shortly after boxwoods have begun new growth. Adult boxwood leafminers are 2.5 mm long, mosquito-like flies. They often can be observed swarming around boxwoods during the spring as the new, pale green foliage expands. Spray with a registered insecticide when larvae have just hatched and before damage occurs. A contact spray is also effective when adult miners are present.

Boxwood psyllids — These are green, sucking insects that cause terminal growth to be stunted and leaves to become cupped. The cupping forms a protective shelter in which nymphs (young insects) feed. The nymphs mature and molt into adults in May to early June. Spray with a registered insecticide in May or June when new foliage develops to control the adults. If a granular insecticide is used, it should be applied in early spring just before new growth begins. If only a few tips are affected, they may be pruned out and destroyed. Both English and American boxwoods are affected, but American boxwood is more likely to be severely infested.

Twospotted spider mites — These are important pests on many ornamental crops in North Carolina. Violets, chickweed, pokeweed, wild mustard, and blackberry are common weeds from which infestations can develop on nearby landscape plants. Twospotted spider mites pierce the epidermis of the leaf with their sharp, slender mouthparts. When they extract sap, the mesophyll tissue of the leaf collapses in the area of the puncture, forming a small chlorotic spot. After a heavy attack, an entire plant may become yellowed or bronzed. Most of the damage occurs in the summer.

Phytophthora root rot — This is caused by *Phytophthora parasitica*, a soil borne fungus that is wide spread in North Carolina. The first symptom of root rot is the loss of the dark, shiny green leaf color. Leaves gradually turn a light straw color when plants are grown in the sun or dull green when grown in shade. Symptoms appear on one branch or section of the plant, but gradually other branches are affected until the entire plant declines or dies.

Phytophthora root rot is most likely to occur in poorly drained soils. When the soil is saturated, the fungus penetrates into feeder roots and moves up the roots causing a dark discoloration. The outer cells of rotted roots slough-off easily leaving only the central portion. In advanced cases the bark on the main stem just above the

soil may also slough-off. Boxwoods that die should not be replanted with boxwoods since the disease is soil borne. Chemical treatment has limited effectiveness. Providing good drainage and optimum growing conditions is the most effective method of treatment.

English boxwood decline— This can best be described as a slow gradual decline. It only affects English boxwoods and is caused by a complex of fungi and cultural practices. Foliage symptoms develop over a period of one to several years. The earliest symptoms are slightly off-colored areas in the plant. Leaves of affected stems progressively turn bronze, orange, dull green and straw-yellow, finally turning brown with defoliation leaving a gray skeleton of twigs. Providing optimum growing conditions is the best means of avoiding English boxwood decline. This includes prevention of moisture stress, removal of plant debris, and protection from winter injury.

Nematodes — Several nematodes damage boxwoods, including lesion (*Pratylenchus vulnus*), root knot (*Meloidogyne arenaria*), boxwood spiral (*Helicothlenchus buxophilus*), and ring (*Macroposthora xenoplax*). Lesion nematode is the most common and damaging nematode on boxwoods. These nematodes are

widespread in North Carolina making nematode decline the most common disease on boxwoods. Above ground symptoms of nematode damage are often similar to those of Phytophthora root rot — growth is stunted and the plant is in decline. Nematode damage can also occur as twig dieback, excessive leaf drop, or bronze foliage. Currently, the only practical responses to boxwood nematode problems in the landscape are to lime soils to a pH of 7.0, fertilize, water regularly to avoid moisture stress, or replace boxwoods with a plant that is not susceptible to nematode injury.

Further Reading

- Batdorf, Lynn. 1995. *Boxwood Handbook, A Practical Guide to Knowing and Growing Boxwood*. The American Boxwood Society, PO Box 85, Boyce, VA 22620.
- *Boxwood Leafminer*, Ornamental Insect Note 16.
- *Boxwood Pest Management Calendar*, Ornamental Insect Note 53.
- *Planting Techniques for Trees and Shrubs*, Horticultural Information Leaflet 8601.
- *Phytophthora Root Rot and Its Control*, Plant Pathology Note 13 .