

## Selecting Landscape Plants: Boxwoods

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The slow- and low-growing 73-year-old planting of Dwarf Korean Boxwood (*Buxus sinica* var. *insularis* 'Nana') lines a pathway and emphasizes an entryway at the State Arboretum of Virginia in Boyce, Va.

### Introduction

Humans have been using boxwoods for about 6,000 years. The name boxwood is derived from the ancient Greeks. Later, the Romans crafted small, elegant boxes from the heavy, fine-grained wood that women used to store valuables. The wood has also been used for musical instruments, writing tablets, combs, carved ornaments, and images, among other uses. The first garden use of boxwood occurred in about 4,000 B.C. by Egyptians who maintained clipped boxwood hedges.

Boxwoods are very useful, attractive garden and landscape plants. There are numerous cultivars, and they can be used to serve several landscape functions. However, the successful use of boxwoods is contingent on selecting the appropriate cultivar, providing a suitable habitat, and supplying the appropriate care and necessary resources.

This publication will cover the many aspects that will impact your choice of boxwoods in a garden or landscape setting. It will also cover the types and cultivars that are available at garden centers.

### Boxwood Species

There are about 90 species of boxwood from Eurasia, Africa, the Caribbean, and Central America. However, only three boxwood species — Littleleaf Boxwood (*B. microphylla*), Common Box (*B. sempervirens*), and Korean Boxwood (*B. sinica* var. *insularis*) — and hybrids of these species are used in the nursery and landscape trades.

#### Littleleaf Boxwood (*Buxus microphylla*) – Zones 5 to 9

Littleleaf Boxwood is a slow-growing shrub with a compact round form. Older literature cites two botanical varieties of *B. microphylla*: *B. microphylla* var. *japonica* and *B. microphylla* var. *insularis*. The latter variety has also been listed as *B. microphylla* var. *koreana*. *B. microphylla* var. *insularis* has been reclassified as *B. sinica* var. *insularis*. The form and size of Japanese Boxwood (*Buxus microphylla* var. *japonica*) is quite variable, ranging from low growing to upright tree form, and it generally requires pruning to keep it in a kempt state. It is quite hardy (to zone 5 of the U.S. Department of Agriculture's Plant Hardiness Zone Map), and is especially suited to the heat of the southern United States, and very pollution-tolerant.

#### Common Box, American Boxwood (*Buxus sempervirens*) – Zones 5 to 6 (to Zone 8, depending on the cultivar)

Common Box is a shrub or small tree, but the form and size within the species is quite variable. There are more Common Box cultivars (400+) than the combined number of cultivars of other boxwood species. The wide array of cultivars derives from the great amount of variation in leaf shape and color and plant size and form. Because of its propensity to grow to large proportions, it is important to choose a cultivar that will not outgrow its intended location.

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## Korean Boxwood (*Buxus sinica* var. *insularis*) – Zones 4 to 8

Korean Boxwood is quite variable in size, ranging from 2 to 7 feet tall and to 10 feet wide. It also has smaller leaves and a less-compact, looser habit compared to Common Box. Korean Box is quite hardy and can tolerate the minimum temperatures of Zone 4 (minus 30 degrees Fahrenheit). A disadvantage of this species is that the foliage of some cultivars is light green.

## Boxwood Popularity

Boxwoods are popular landscape plants, and there are several reasons for their popularity.

- Boxwoods have an evergreen, compact, symmetrical form (fig. 1). These characteristics confer a formal appearance to boxwood, which is why boxwoods are commonly used in formal gardens.
- There are numerous boxwood cultivars that offer a variety of forms (e.g., round, oval, conical, columnar) and sizes, from dwarf shrubs (i.e., very slow growing, shorter than 3 feet tall at maturity) to large shrubs (i.e., medium to fast growing, to at least 8 feet tall at maturity). Mature plant size is related to growth rate that, in most cases, ranges from 3 to 6 inches per year. An exception to this generalization is the new-to-the-trade cultivar ‘Highlander’ (*Buxus sempervirens*) that grows about 24 inches per year (once established). Of course, the growth potential of any cultivar will be influenced by the growing conditions.
- Boxwoods have versatile garden and landscape uses. They:
  - Serve as short to medium-sized walls in border (hedge) plantings (fig. 2).
  - Are used to partition or edge garden beds (fig. 3).
  - Act as foundation plants (plants at the base of a building or structure; fig. 4).
  - Serve as accent plants, for example, on either side of a doorway to lend emphasis or to frame an entrance or pathway (figs. 5, 6, and cover photo).
  - Are used as topiaries.
- Boxwoods provide color, plant form, and texture contrast to companion plantings. Boxwood’s dark green foliage color, the relatively visually neutral round to oval shapes (of most cultivars), and the fine foliage



Figure 1. Boxwoods are evergreen and typically have a compact, symmetrical form; *Buxus sinica* var. *insularis* ‘Wintergreen’ is shown. All photos are by the author.



Figure 2. Boxwoods serving as a hedge (short wall function); *Buxus sempervirens* ‘Inglis’ is shown.



Figure 3. Boxwood hedges used to partition garden beds and provide contrast to adjacent plants.



Figure 4. Boxwoods serving as foundation plants.



Figure 5. Boxwoods framing an entryway; *Buxus sempervirens* is shown.



Figure 6. Boxwoods framing an entryway; *Buxus* 'Green Mound' is shown.



Figure 7. Boxwoods (center diamond-shaped plants) emphasize the colors and textures of adjacent plants; *Buxus* 'Green Velvet' is shown.

texture (via small leaves) emphasize the contrasting colors, shapes, and textures of adjacent plants (fig. 7).

- If the appropriate cultivar is selected for a site (with respect to climate, soil, and sun aspects) and intended landscape use, then boxwoods require very little maintenance.
- Published and anecdotal reports note that deer generally tend to avoid boxwoods as a food source.

## Boxwood Culture

Boxwood appearance and performance in the landscape are contingent on the species/cultivar selected, the locality (primarily climate aspects), and the growing environment (e.g., soil, light exposure, and rainfall/irrigation amount). Thus, it is important to match the choice of boxwood species/cultivar to the climate, growing environment, and intended landscape use. The following section addresses boxwood culture — the environmental aspects that favor boxwood growth.

## Sun Exposure

Boxwoods grow well in full sun to part shade; however, they look and perform best in a location that has some shade, especially in the afternoon. This is particularly true in the winter because leaves may desiccate when the ground is frozen and roots cannot absorb water. While many cultivars tolerate full sun, some must have afternoon shade to maintain a healthy appearance.

## Soil Aspects

Soil aspects are also important for boxwood growth. Soil pH should be in the range of 6.5 to 7.2, but values just above or below this range will result in acceptable growth. A soil test will supply the soil pH and nutrient status of the soil (see Virginia Cooperative Extension publication 452-129, “Soil Sampling for the Home Gardener”; [http://pubs.ext.vt.edu/452/452-129/452-129\\_pdf.pdf](http://pubs.ext.vt.edu/452/452-129/452-129_pdf.pdf)). The soil test will also provide information on amendments (if needed) to adjust the pH as well as recommended fertilizer amounts.

Paying attention to site conditions and matching the species to the conditions will greatly increase the success of boxwood planting. Boxwoods can grow in a variety of soil textures (relative amounts of sand, silt, and clay), but too much sand (a low water-holding content) or too much clay (too high a water-holding content and too low an air-holding content) should be avoided. A soil that is well-drained is essential; thus, low areas of the landscape that tend to stay moist or wet do not support boxwood growth.

## Mulching and Irrigation

The ground surrounding boxwoods should be mulched. Mulch reduces water evaporation from the soil and thereby maintains more moisture in the soil than an area without mulch. Make the mulch ring or mulched bed area at least 3 feet from boxwood plants to minimize competition for water from surrounding grass roots. Tree and shrub roots will also compete for soil water, and this should be taken into consideration in determining the amount and frequency of supplemental irrigation. Tree roots can extend far beyond the drip line of the tree (the lateral distance of branch tips from the trunk), so tree roots near boxwoods will also compete for water.

While tolerant of some drought, **boxwoods should be irrigated during periods of drought**. Drought-stressed plants will often succumb to pathogens or plant decline in the months and years following the stress.

**Providing boxwoods with the appropriate soil, moisture, and light conditions will result in healthy plants. Poor plant health and disease problems are often the result of too much water (inadequate soil drainage or too much irrigation), drought stress, or stress from too much sun (for certain cultivars).**

## Pruning and Thinning

If a boxwood cultivar is chosen that has the growth rate and mature size that is appropriate for the desired landscape use, very little pruning for size control is necessary. Some boxwood cultivars inherently have a dense outer layer of foliage (foliage is closely set), while others have a less-dense canopy (spaces between leaves and stems).

Boxwood cultivars with dense canopies, such as the classic English Boxwood (*Buxus sempervirens* ‘Suffruticosa’), need to be thinned every one to two years. A dense foliage canopy excludes light from the inner portion of the plant and fosters a humid, low-light atmosphere — conditions that are conducive to disease occurrence. Thinning is accomplished by removing 3- to 6-inch pieces of branch tips throughout the canopy. Thinning promotes air circulation and light penetration, thereby making the interior of the plant less favorable for the manifestation of fungal diseases. Such stem removal also promotes the growth of intracanopy foliage. A porous foliage mantle results in a healthy and sturdy plant with strong stems that are less likely to break from the weight of snow loads.

Thinning can be accomplished at most times of the year except for the late summer or early fall. Pruning at this time can promote new shoots that may not sufficiently harden off before the onset of cold weather and could be damaged by low temperatures.

Boxwood cultivars without a dense foliage layer are commonly sheared to produce a more uniform, dense canopy. While shearing produces these results, it also alters the previously mentioned light penetration and air circulation aspects that can increase disease incidence. Sheared plants should be thinned occasionally.

## Boxwood Pests

Boxwoods can be afflicted by insect, disease, and nematode (microscopic roundworms) problems. Some of these pests cause minor problems while others can cause major problems. As will be discussed, disease

issues of landscape boxwoods are generally related to poor growing conditions.

The two most common insect pests of boxwoods are boxwood leafminer and boxwood psyllid.

### Boxwood Leafminer

Boxwood infested with boxwood leafminer is a serious problem, especially when populations of the miner are medium to large. The leafminer’s immature form is a small larva (fig. 8) that feeds between the upper and lower leaf surfaces. This feeding results in discoloration and blistering of the leaf surfaces (fig. 9). **Medium-to-large populations will greatly reduce the vigor of the plant, and pesticide treatment is recommended.**



Figure 8. Boxwood leafminer larvae between the upper and lower leaf surfaces.



Figure 9. Leaf discoloration and blistering symptoms manifested by leafminer infestation.

In midspring (usually April, when *Weigela* begins to bloom), larvae will pupate (transition from larvae to adult). Adults (small flying insects resembling orange mosquitoes) will emerge and then lay eggs in surrounding boxwood leaves.

Timing of pesticide application for larvae or adults is important. Chemicals and timing recommendations are provided in VCE publication 456-017, the

2012 Virginia Pest Management Guide: Horticultural & Forest Crops, chapter 4: Nursery Crops, Insects, table 4.3, page 4-27 (<http://pubs.ext.vt.edu/456/456-017/456-017-HorticulturalForestCrops-Book-12.pdf>).

Some boxwood cultivars tend to be more prone to infestation than others. In some leafminer trials, all cultivars tested show susceptibility. One study showed that the cultivars ‘Handsworthiensis’ and ‘Vadar Valley’ (both cultivars of *Buxus sempervirens*) demonstrated the greatest amount of leafminer resistance. Saunders Brothers Inc. (boxwood experts with a boxwood nursery) notes that *Buxus sempervirens* ‘Vadar Valley’ and ‘Suffruticosa’, *Buxus sinica* var. *insularis* ‘Nana’, and almost all the dwarf *Buxus microphylla* cultivars show resistance to leafminer.

## Boxwood Psyllid

Boxwood psyllid is a relatively minor problem unless psyllid populations are medium to large. Young psyllids feed on the upper surface of leaves, resulting in a characteristic cupping of the leaves (fig. 10). Chemicals and timing recommendations are also provided in the 2012 Virginia Pest Management Guide: Horticultural & Forest Crops, chapter 4: Nursery Crops, Insects, table 4.3, page 4-29.



Figure 10. Leaf cupping symptom as a result of boxwood psyllid infestation.

## Boxwood Blight

Boxwood Blight is a recently discovered (2011) fungal disease that poses a serious threat to boxwood. This disease was first detected in Connecticut, North Carolina, and Virginia, but the origin of the pathogen is unknown. The main symptoms of the disease are rapid defoliation and stem lesions. The disease is most prevalent in humid environments. At the time of this publication (September 2012), the disease has not been found outside of the two Virginia nursery fields where it was

found. For more information on Boxwood Blight, see VCE publication PPWS-4, “Boxwood Blight: A New Disease of Boxwood Found in the Eastern U.S.,” at <http://pubs.ext.vt.edu/PPWS/PPWS-4/PPWS-4.html>.

Boxwoods are also susceptible to a few other diseases and nematodes; however, the occurrence of these problems can be mostly attributed to poor plant growing conditions. Providing the appropriate soil, moisture, and light environments to foster healthy plants cannot be overemphasized. For more information on diseases, see VCE publication 450-614, “Major Diseases of Boxwood,” at <http://pubs.ext.vt.edu/450/450-614/450-614.html>. Also, stem thinning is strongly recommended for cultivars with a dense foliage mantle (see the previous section, Pruning and Thinning).

## Boxwood Cultivars

There are numerous boxwood cultivars in the nursery and landscape trade. As previously mentioned, they vary in their size, form, general appearance, preference for shade, and susceptibility to insect problems. They also vary in their landscape use. The slower-growing cultivars are generally used for edging garden or landscape beds (fig. 11), whereas the faster-growing and more upright cultivars are used for borders, foundation plants, or accent plants.



Figure 11. Boxwoods used to edge garden beds.

Mr. Paul Saunders of Saunders Brothers Inc., a boxwood expert and pioneer in the evaluation of boxwood cultivars, has coordinated boxwood evaluation trials (National Boxwood Trials) throughout the U.S. since 1996. Evaluation trial data (2011) for the numerous cultivars throughout the many regions and states can be found in Boxwood: Choosing the Best – National Boxwood Trials Report 2011, at [www.saundersbrothers.com/\\_ccLib/attachments/pages/2011+National+Boxwood+Trials+Report.pdf](http://www.saundersbrothers.com/_ccLib/attachments/pages/2011+National+Boxwood+Trials+Report.pdf).

Cultivars are rated on two criteria: grower friendliness and impulse cosmetics. Grower friendliness is described by Saunders as “adaptable to a particular environment and relatively easy to grow by nurserymen, orchardists, gardeners, or homeowners.” Grower friendliness traits are related to low susceptibility to insects and disease, ease of maintenance, tolerance to heat and cold, and varying cultural conditions (soil and water conditions). Saunders describes impulse cosmetics as “the striking beauty that makes you spin around in your tracks to take another look at it.” This report also lists the top-ranked cultivars by size category (page 127). Saunders Brothers has also published the Boxwood Guide reference, which can be found on its website at [www.saundersbrothers.com/\\_ccLib/attachments/pages/2011+Saunders+Brothers+Boxwood+Guide.pdf](http://www.saundersbrothers.com/_ccLib/attachments/pages/2011+Saunders+Brothers+Boxwood+Guide.pdf).

The following section highlights the two top-ranked cultivars in each of the size categories, as well as other cultivars. The quoted growth rates for cultivars may vary according to site (e.g., soil, light, and water availability) and location (climate) conditions.

## Upright Cultivars

### ‘Dee Runk’ (*Buxus sempervirens*) – Zones 6 to 8

‘Dee Runk’ has a narrow, conical form (fig. 12; row of ‘Dee Runk’). In 15 years, ‘Dee Runk’ will grow to about 8 feet tall and 2.5 feet wide. This cultivar is the highest-ranked upright cultivar in the National Boxwood Trials.



Figure 12. Upright form of *Buxus sempervirens* ‘Dee Runk’.

### ‘Fastigiata’ (*Buxus sempervirens*) – Zones 6 to 8

‘Fastigiata’ has a conical form and is similar to ‘Dee Runk’ but has a slightly broader habit. In 15 years, ‘Fastigiata’ will be about 8 feet tall and 3 feet wide. This is the second-highest-ranked upright cultivar.

### ‘Graham Blandy’ (*Buxus sempervirens*) – Zones 6 to 8

‘Graham Blandy’ has a columnar form and will grow to about 8 feet tall and 2 feet wide in 15 years (fig. 13).



Figure 13. Upright form of *Buxus sempervirens* ‘Graham Blandy’.

### ‘Highlander’ (*Buxus sempervirens*) – Zones 5 to 9

‘Highlander’ is a new-to-the-trade upright boxwood. This conical cultivar is differentiated from others in that it is fast growing; once established, ‘Highlander’ grows as much as 20 to 24 inches per year.

## Dwarf Cultivars

### ‘Grace Hendrick Phillips’ (*Buxus microphylla*) – Zones 6 to 8

‘Grace Hendrick Phillips’ has a low mounding form (fig. 14) and grows about 1 inch per year; in 15 years it will be 1.3 feet tall and 2 feet wide. This is one of the highest-ranked plants in the National Boxwood Trials and is best suited for small spaces, edging, or a formal garden. Some shade is recommended.



Figure 14. Compact form of the dwarf *Buxus microphylla* 'Grace Hendrick Phillips'.

### 'Green Pillow' (*Buxus microphylla*) – Zones 5 to 8

'Green Pillow' has a low mounding form (fig. 15) and grows about 1 inch per year; in 15 years it will be 1.3 feet tall and 2 feet wide. This cultivar is most suited for small spaces, edging, or a formal garden. Some shade is recommended.



Figure 15. Compact form of the dwarf *Buxus microphylla* 'Green Pillow'.

## Small to Medium Cultivars

### 'Justin Brouwers' (*Buxus sinica* var. *insularis*) – Zones 6 to 8

'Justin Brouwers' is a highly ranked compact boxwood with a round form that makes it especially suitable for formal gardens or for edging (fig. 16). The form and growth rate is similar to the classic English Boxwood (*Buxus sempervirens* 'Suffruticosa'). 'Justin Brouwers' grows about 2 inches per year; in 15 years it will be about 2 feet tall and 2.5 feet wide.

### 'Jensen' (*Buxus sempervirens*) – Zones 6 to 8

'Jensen' has a round form, making it suitable for formal gardens or for edging. Its form and growth rates are similar to 'Justin Brouwers' (previous) and 'Suf-



Figure 16. Round compact form of *Buxus sinica* var. *insularis* 'Justin Brouwers'.

fruticosa' (next). 'Jensen' requires afternoon shade. It grows about 2 inches per year; in 15 years it will be about 2 feet tall and 2 feet wide.

### 'Suffruticosa' (*Buxus sempervirens*) – Zones 6 to 8

'Suffruticosa', commonly called English Boxwood despite not being native to England, is the classic cultivar found in many historic and formal gardens (fig. 17). It is slow-growing (1 to 2 inches per year) and has a round to round-oval compact form with a dense canopy. In 15 years, a plant will be 2 feet tall and 2 feet wide. The foliage of this cultivar has a distinct odor, often likened to cat urine by those who do not admire this scent. The odor is most apparent in warm humid weather because pores (stomates) on leaf surfaces tend to emit more plant gases in moist air than in dry air. People either love or hate this cultivar on the basis of the foliage scent. When the "fragrance" wafts in warm spring and summer days, some wax nostalgic and recollect English Boxwood memories while others are abhorred by the scent. This cultivar is best in part shade and should not be exposed to the afternoon sun.



Figure 17. Round compact form of *Buxus sempervirens* 'Suffruticosa'.

**'Nana' (*Buxus sinica* var. *insularis*) – Zones 6 to 8**

'Nana' has a low mound form and grows about 1 to 2 inches per year (fig. 18 and cover photo). This cultivar shows resistance to leafminer. In 15 years, it will be 1.5 feet tall and 3 feet wide.



Figure 18. Low mound form of *Buxus sinica* var. *insularis* 'Nana'.

**Medium Cultivars**

**'Vadar Valley' (*Buxus sempervirens*) – Zones 5b to 8**

'Vadar Valley' has a low mound form and is one of the highest-ranked cultivars in the trials (fig. 19). 'Vadar Valley' foliage has an attractive bluish hue. It grows about 2 inches per year; in 15 years will be about 1.5 feet tall and 3 feet wide. This cultivar is more resistant to boxwood leafminer than many other cultivars.



Figure 19. Low mound form of *Buxus sempervirens* 'Vadar Valley'.

**'Elegantissima' (*Buxus sempervirens*) – Zones 6 to 8**

'Elegantissima' has an upright oval form and beautiful variegated leaves that have striking white edges (figs. 20 and 21). This cultivar is best in part shade and should not be exposed to the afternoon sun. It grows 1

to 2 inches per year and will be about 2.5 feet tall and 2 feet wide in 15 years.



Figure 20. Upright oval form of the variegated *Buxus sempervirens* 'Elegantissima'.



Figure 21. Cream and green foliage colors of *Buxus sempervirens* 'Elegantissima'.

**'Wintergreen' (*Buxus sinica* var. *insularis*) – Zones 5 to 8**

'Wintergreen' has a rounded to oval form and grows about 5 inches per year. In 15 years, a plant will be about 4 feet tall and wide (fig. 22).



Figure 22. Rounded form of *Buxus sinica* var. *insularis* 'Wintergreen'.



## Large Cultivars

### American Boxwood, Common Box (*Buxus sempervirens*) – Zones 5 to 8

The American Boxwood, sometimes noted as *B. sempervirens* ‘Arborescens’, has an upright oval form, grows about 4 inches per year and will be 5 feet tall and 4 feet wide in 15 years (fig. 23). Old specimens in the U.S. can be 20 feet tall but 50-foot native specimens have been found in the modern day countries of Georgia and Turkey.



Figure 23. Upright oval form of *Buxus sempervirens*.

The moniker “American Boxwood” is an oxymoron because *Buxus sempervirens* is native to Southern Europe, Northern Africa, and Western Asia; there is nothing American about this cultivar with the exception that it has been widely used in the U.S. Other large shrub cultivars are ‘Elizabeth H. Inglis’ and ‘Wintergreen Big Leaf’.

## Sheridan and Glencoe Hybrids

### ‘Green Mountain’ (hybrid of *Buxus sinica* var. *insularis* × *Buxus sempervirens*) – Zones 4 to 8

‘Green Mountain’ has an upright oval shape and grows about 3 inches per year (fig. 24). This is an especially



Figure 24. Upright oval form of *Buxus* ‘Green Mountain’.

hardy cultivar and is rated to zone 4 (winters with minus 30 F). In 15 years, the plant will be about 4 feet tall and 3 feet wide. This cultivar has been noted to be quite susceptible to boxwood leafminer.

### ‘Green Velvet’ (hybrid of *Buxus sinica* var. *insularis* × *Buxus sempervirens*) – Zones 4 to 8

‘Green Velvet’ has somewhat of a round or mounded shape and grows about 3 inches per year. This is an especially hardy cultivar and is rated to Zone 4 (winters with a minimum temperature of minus 30 F). In 15 years, a plant will be about 2 feet tall and 2.5 feet wide. This cultivar has been noted to be quite susceptible to boxwood leafminer.

## Boxwood Collections

There are two excellent and comprehensive boxwood collections in the U.S.

1. The National Boxwood Collection at the U.S. National Arboretum ([www.usna.usda.gov/Gardens/collections/boxwood.html](http://www.usna.usda.gov/Gardens/collections/boxwood.html)) in Washington, D.C., which contains the most complete living collection of boxwood.
2. The American Boxwood Society Boxwood Memorial Garden at the State Arboretum of Virginia in Boyce, Va. (fig. 25; [www.virginia.edu/blandy/brochures/box\\_brochure.pdf](http://www.virginia.edu/blandy/brochures/box_brochure.pdf)).



Figure 25. Boxwoods frame the sign for the American Boxwood Society Memorial Garden at the State Arboretum of Virginia in Boyce, Va.

## **Boxwood Literature**

In addition to the aforementioned texts by Mr. Paul Saunders and Saunders Brothers Inc. (Boxwood Cultivar section), the American Boxwood Society has published two references authored by Mr. Lynn R. Batdorf, curator of the National Boxwood Collection at the U.S. National Arboretum in Washington, D.C.

1. The Boxwood Handbook: A Practical Guide to Knowing and Growing Boxwood – A comprehensive, 123-page text that describes the culture, propagation, and pests of boxwoods as well as recommended cultivars.
2. Boxwood: An Illustrated Encyclopedia – This scholarly, 343-page text contains 335 color photos and is photos and is a comprehensive account of the known temperate boxwood — nearly 1,050 different plants.