

Excerpts from *Bamboo for Gardens* by Ted Jordan Meredith

Controlling Spreading

Mentioning bamboo in a gathering of any size is nearly certain to prompt hysterical cursing from someone who has experienced an attack from the demonic plant that invaded unexpectedly and ceaselessly, and could not be stopped or killed. Such fear and venom is primarily directed at bamboos with a diffuse growth habit.

..... The spread of leptomorph bamboos (running bamboo) can be easily controlled, but to understand the methods of control, it is helpful to first understand bamboo's growth habits. Leptomorph bamboos form a network of rhizomes. If the rhizome network remains unsevered, all the culms, no matter how distant, remain part of the same plant. As we have seen, the rhizomes provide the stores of energy necessary for the brief, intense period of culm growth, and in turn, the rhizomes need the culms and masses of foliage leaves to generate energy reserves for sustenance and storage. Without the culms, and foliage leaves to sustain them, the rhizomes' energy reserves would become exhausted, and the rhizomes would wither and die. If the culms and foliage are removed from the rhizome system, the rhizome system will attempt to generate new culms and foliage to nourish and sustain the system. If the new shoots are removed before they become leaf-bearing culms capable of generating food for the rhizome system, the rhizome system will not be able to sustain itself. No new culms can emerge from a dead rhizome system. As we shall see, understanding this growth habit is key to managing bamboo's growth and spread.

New rhizomes are relatively tender and can easily be severed with a spade. And, lacking an extensive root system, the severed new rhizomes can easily be pulled from the ground. but the largest running bamboos, species of *Phyllostachys*, have relatively shallow rhizome systems. In general, the active part of the rhizome system is shallow, not deep. An older grove may have a thick layer of rhizomes, but the lower layers will consist primarily of older rhizomes that are no longer capable of producing new culms or new rhizomes. Unless turned downward by an obstacle, the new rhizomes of most species grow within the first foot or so of soil, and typically within the first 4 to 6 in. of soil. Like bamboo's aboveground culms, and unlike trees and tree roots, rhizomes do not increase in diameter with the passing years. Bamboo rhizomes are fixed in diameter and shallow running. Unlike tree roots, the shallow-running rhizomes do not invade sewer pipes, nor do they enter cracks in foundations, expanding the cracks and weakening the structure. In this regard, bamboo is far more benign.

The condition and cultivation of the soil at planting is a factor in the ability to control bamboo's spread in future years. Bamboo thrives in loose, loamy, well-drained soil. The top foot of soil should be thoroughly worked to encourage growth, but leaving the soil beneath unworked encourages the rhizomes to remain in the looser soil nearer the surface. A hard-packed, dense layer of soil beneath a shallow layer of loose, loamy soil will make some of the various control methods easier and more effective, particularly for those bamboos that have rhizomes with deeper running tendencies. Control will be more difficult in exceptionally deep, loose and rich soils if an abundance of water is available to the plant.

Soils that are warm at greater depths can also encourage rhizomes to grow more deeply, thus making control more difficult.

Control Methods

Interest in controlling the spread of bamboo has long been with us. Because the growth habits of bamboo differ from other plants in Western culture, its control is often poorly understood. Once understood, however, controlling bamboo's spread and maintaining boundaries is relatively simple. A number of strategies can be employed. Each has its advantages and areas of application.

Rhizome barriers. Although it requires the most initial effort, a rhizome barrier offers a nearly maintenance-free method of control. Where a grove borders an inaccessible area, such as a neighbor's fenced yard, a rhizome barrier is the best method of control. A barrier system is reliable and trouble-free for most bamboos in most climates. However, bamboos with deep-running rhizome systems, in soils that are loosely textured, warm, and moist to a depth of several feet during the rhizome growth period could present containment concerns. Consult local bamboo growers with similar bamboos and growing conditions to more specifically assess control concerns and barrier requirements.

In this containment system, a barrier 2.5 to 3 feet deep is inserted into the ground around the desired perimeter of the bamboo grove. Approximately 2 in. are left to protrude above ground to allow for a build-up of mulch from leaf fall or added materials and still provide a lip above the soil. Once a year, in late fall or early spring, the barrier should be examined to ensure no rhizome has escaped over the top. In the rare event a rhizome leaps the barrier, it can be cut and pulled from the soil or simply repositioned inside the barrier. Ideally, the barrier should tilt outward slightly at the top so that any rhizomes colliding with the barrier will be directed upward. If a large, vigorous rhizome is redirected downward, it could make its way underneath a marginally deep barrier. A 2.5 foot barrier is generally safe, but for deep, loose, sandy soils in combination with bamboos having deep and fast-running rhizome systems, one may be better off with a barrier that is 3 feet deep and even at that, the plants could still cause problems.

Barriers may be made of a variety of materials. Concrete or corrugated metal are traditional barrier materials. Concrete may work well in some situations, but it is heavy, bulky, and difficult to move or remove. Corrugated metal is less attractive, eventually deteriorates, and is not recommended for areas with cold winter climates because the metal conducts heat away from the soil, and so can contribute to plant losses from freezing. Fiberglass is not recommended because it is prone to cracking and breakage. Increasingly, heavy plastic is the material of choice.

High-density polyethylene (HDPE) black plastic barrier material is available from various bamboo nurseries and hardware stores, and can be cut to the length desired. It should be 60 mil thick and, typically, 2.5 feet wide. It is light, fairly attractive, relatively easy to handle, and is not subject to cracking, corrosion, or decay. Thinner barrier material is sometimes sufficient, but may not be reliable over time, particularly with larger bamboos.

When positioning the plastic barrier, the seam should be without gaps and should overlap by a foot or two. Ideally, the seam should be sealed with glue and rivets or small bolts, or some similar sealing and clamping method. As an extra safety precaution, the seam should be situated where any compromise of the seal, and escape of a rhizome, would be readily apparent and manageable. For example, the seam should not be placed on the outer side of the clump or grove, adjacent to the fenced border of a neighbor's property, but on the inner side of the clump or grove, away from the fence.

Raised beds. A raised bed is really just an aboveground rhizome barrier. A raised bed 2.5 to 3 feet high will keep bamboo from spreading, just as it would if the barrier were in the ground. Incorporated into architectural and landscape design however, raised beds can offer striking and unique displays of bamboo.

Rhizome pruning. (This method is not recommended for anyone other than a true bamboo enthusiast.)

Containers. As we will discuss in more detail later in the chapter, bamboo makes an excellent plant for containers. When grown in this way, the container itself becomes the barrier for controlling spread. The drainage holes, however, are a potential source of escape for the rhizomes. A "saucer" underneath the container, similar to the arrangement for indoor plants, will prevent the rhizomes from escaping into the soil. Alternately, the drainage holes can be covered with a sturdy plastic mesh or something similar.

Even if measures are taken to prevent the escape of rhizomes into the soil outside the container, periodic inspection is still a good idea. In most instances, it is easiest and most convenient to dispense with supplemental control methods for the drainage holes, and simply check the drainage holes in late fall, winter, or early spring. If any rhizomes have escaped, they can either be cut off or repositioned inside the container.

Natural and landscaped barriers. Natural and landscaped barriers have many forms. Usually they work best where precise control is not critical. They may also be employed in conjunction with other control methods.

Hard-packed, unmulched soil is not conducive to either rhizome or culm growth, and so bamboo will not grow in well-used paths and roads. Any new shoots, if not harvested, will be quickly obliterated by foot or wheel. On the other hand, a dirt road that is not hard packed and dust dry during the season of rhizome growth may allow rhizomes to pass under to a more amenable location for shoot and culm growth.

Unless there are existing cracks or fissures, bamboo cannot shoot through solid asphalt roads or solid concrete patios. Shallow asphalt, however, is somewhat friable and subject to incursion, particularly along the perimeter. An asphalt road will easily stop a small suburban plot from spreading, but if the layer of asphalt is shallow, a large grove of timber bamboo could send the rhizomes underneath the road to the other side. A sidewalk may control groundcover bamboos, but not larger bamboos, which can readily send rhizomes to

the other side of the sidewalk. Similarly, a wide but shallow concrete patio may not stop a larger grove of bamboo, but it could be an effective barrier for a smaller bamboo grove.

If adequately deep, any manner of unbroken vertical barrier, including rock faces, walls, or building foundations, can stop bamboo from spreading. The hard, pointed rhizome tips may find their way into small openings, but unlike tree roots, bamboo rhizomes remain a fixed diameter and do not expand and break apart what they have penetrated.

Water also stops bamboos from spreading. Streams, ponds, lakes, and irrigation ditches are natural barriers. Because livestock eat new shoots and leaves, a fence with livestock on the other side is also an effective barrier.

Shoot Removal. (This method is not recommended for anyone other than a true bamboo enthusiast.)

Eradication

Bamboo nurseries sometimes offer bamboo removal services. Depending on the type of bamboo, the nursery, and the local market, you may be paid for the bamboo, charged for removal, or the removal may be free. Some nurseries have specialized tools that enable them to cut through a well-established grove's thick cake of rhizomes. These chunks of the grove can then be potted and sold to their customers.

Killing bamboo is not easy but it can be done. It is essential to remember that a grove is not a group of bamboo plants (unless more than one plant was originally planted to establish the grove), but must be treated as a single plant connected by a network of rhizomes. If only a portion of the grove is to be killed then that portion must first be separated from the rest of the grove. Such a situation is common when bamboo crosses over from a neighbor's property. Severing all rhizome connections between the property lines is essential. Attempts to kill bamboo on one side of the property line will be unsuccessful as long as the rhizomes remain connected to the bamboo on the other side of the property line.

Unfortunately, unlike the yearly regimen of pruning the tender new rhizomes around the circumference of a grove, cutting through the thick, dense cake of tough, woody rhizomes at the core of an established grove may be very difficult without a specialized tool or reciprocating saw. Lacking such tools, an ax as well as a sharp spade may be necessary.

Several suppliers and bamboo nurseries sell specialized tools for cutting through the cake of old rhizomes.

Bamboo can be also eliminated by cutting away all culms and breaking off any new shoots before they leaf out. Because a bamboo plant must have leaves to nourish itself and store energy in the rhizomes, depriving it of this source of food will exhaust the rhizome's energy reserves, causing it to wither and die.

Systemic herbicides alone can often eradicate bamboo, but bamboo is very resistant, and several herbicide applications may be necessary. If herbicide drift is a concern, the tall existing culms can first be cut down or pruned to a height that makes herbicide drift manageable. Although repeated herbicide application may eventually eradicate bamboo, most environmentally tolerable herbicides need a plant to be in foliage for the herbicide to be effective. Bamboo uses the foliage leaves not only to sustain itself, but also to generate energy reserves for its rhizome system. If herbicides are used, they are often best employed in a regimen that, at some point in the process, discontinues herbicide application and calls for removal of new shoots before they leaf out.

Bamboo can be eradicated without the addition of any herbicides or chemical fertilizers, but these can be employed to accelerate the process. There are variations on the theme, but an effective regimen for eradication is as follows: cut the aboveground growth to the ground with a lawnmower, pruning shears, hand saw, chain saw, or other implement, as fits the situation. Water and fertilize to encourage the rhizomes to generate new growth. If necessary, limit the height of the new shoots by pruning. As soon as the new shoots have leafed out, stop all watering, fertilize very heavily with a high-nitrogen fertilizer, and spray with a strong herbicide. Remove the culms and foliage once the herbicide has been fully absorbed. Remove all subsequent shoots before they leaf out. Damaged by the herbicide and stressed and weakened by overfertilization and lack of water, the bamboo's demise is accelerated.

On a larger scale, bamboo can also be removed by cutting down the culms, then ripping up and removing the rhizomes with a tractor or similar machinery.