



# CAES

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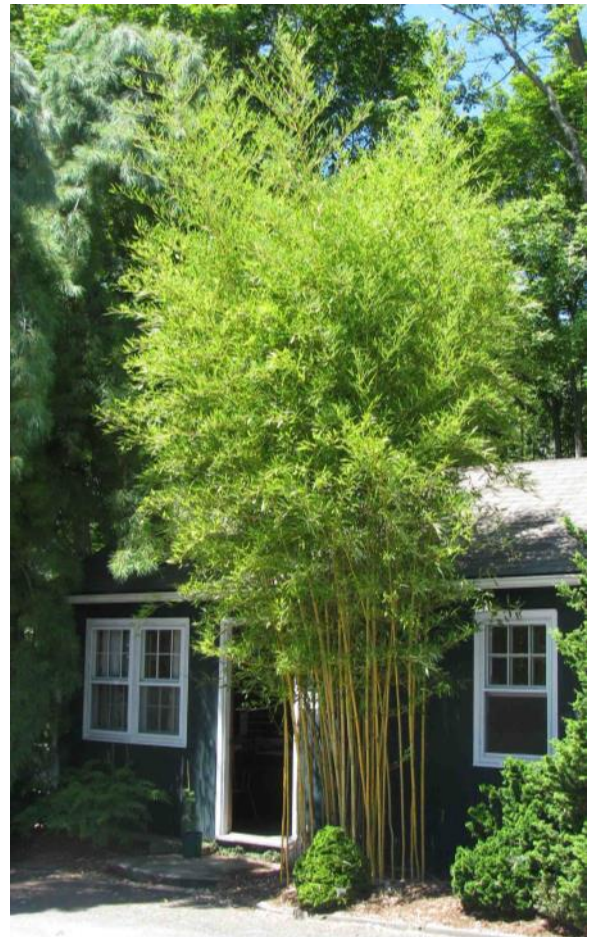
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## **RUNNING BAMBOO (*Phyllostachys* spp.) IN CONNECTICUT**

There are some plants that are either loved or hated – including running bamboos. What are the bamboos that have caused controversy? They are not the invasive Japanese knotweed (*Polygonum cuspidatum*) that is often mistakenly called Japanese bamboo. They are not the graceful clumping bamboos (*Fargesia*) or beautiful ground cover/shrub bamboos (e.g., *Pleiblastus*, *Sasa*). The controversial bamboos are members of the genus *Phyllostachys* that have rhizomes<sup>1</sup> that can extend well away from the original planting.

World-wide there are upwards of 75 *Phyllostachys* species and 200+ cultivars. There are about ten species and numerous cultivars that can grow in southern New England, though not all are consistently winter-hardy. Depending on the species, mature stands can reach height of 20-50+ feet with culms (canes are cut culms) that range in color from green to golden yellow to nearly black. Properly sited and controlled, these quick-growing, deer browse proof species can produce an elegant border screen or formal accent point in a garden. Older culms can be cut by homeowners to provide a renewable source of garden stakes.



**Figure 1. When planted in an appropriate site with a root barrier system, running bamboo can be striking.**

<sup>1</sup> Rhizomes are underground stems that send out roots



**Figure 2. Uncontrolled running bamboo can become a nuisance when it grows into a neighbor's yard.**

The Connecticut Invasive Plants Council determined that running bamboo did not meet the statutory criteria for inclusion on the invasive list because it has not moved from cultivated landscapes to natural areas. Although *Phyllostachys* has been grown in the United States since at least 1907, there have been no reports of it producing viable seed. Except for vegetative spread via rhizomes, it appears that all *Phyllostachys* in Connecticut originated from plantings or discarded culms. Because it is a sun demanding species, *Phyllostachys* has only been observed colonizing the very edge of undisturbed woods. In addition, the inability of the rhizomes to tolerate even seasonally wet soils means that streams and wetlands provide a barrier to its local expansion.

The Invasive Plants Council did provide recommendations to the legislature to address concerns of neighboring landowners. The recommendations that were included in Public Acts 13-82 and 14-100 included notifying buyers that running bamboo can spread beyond the original planting site, and that it should be planted either with an effective root barrier system or at least 40 feet from a neighboring property line.

The problem with *Phyllostachys* is that many homeowners are unaware that the rhizomes do not respect property lines. Similar to many native species that spread vegetatively via root suckers (e.g., sumac, shrub dogwood, viburnum) or rhizomes (e.g., hay-scented fern, goldenrod, aster), *Phyllostachys* evolved to spread vegetatively by sending up new culms at nodes along the rhizomes. When the new culms emerge in a neighbor's lawn, flower bed, or inside their siding, there are going to be conflicts. The unfortunate reality is that many folks have planted running bamboo near property boundaries without understanding the necessity of installing a proper root barrier.

To keep *Phyllostachys* where it is appreciated and not wandering into the neighbor's yard, all plantings should be in aboveground containers or have a durable barrier that extends down at least 28 inches. It is important that the barrier be at a slight outward angle to encourage rhizomes to grow up towards the soil surface and that the barrier be a couple of inches aboveground to spot (and



**Figure 3. A properly installed root barrier can keep running bamboo where it is planted.**

cut off) any rhizomes growing over the barrier. CT Nursery and Landscape Association has developed a tag that sellers can use to meet the legal requirement of providing all buyers with a statement that “running bamboo is a fast growing plant that may spread if not properly contained.” This tag also provides detailed information on properly installing a root barrier.<sup>2</sup>

## CONTROL

Controlling running bamboo can be problematic, especially where it has grown into areas with desirable vegetation. First, it must be noted that treating culms at a distance from an established clump is only a short-term solution unless that rhizomes of the established clump are fully contained. Assuming that the rhizomes are not contained with an effective root barrier, or that the goal is to kill all of the bamboo, there are several possible approaches. The most drastic and disruptive method would be to excavate all the rhizomes. Handbooks differ on whether repeated mowing may eventually kill rhizomes if they are not attached to a clump with intact culms, but there have been no published reports on this technique.

Unfortunately, there have been few published studies on using herbicides to control running bamboo. A Georgia study reported a single application of either glyphosate or imazapyr reduced the density of, but did not kill, *Phyllostachys rubromarginata* (a species not hardy in Connecticut). A summary of our research on the effectiveness of foliar spray is given below. A USDA publication also suggests bamboo can be controlled by treating culms cut at ground level with herbicides at twice the strength of foliar sprays<sup>3</sup>.

Because much of the information on the rate of spread and control of *Phyllostachys* is anecdotal, we began a series of experiments in 2012 at our experiment farms and at several field sites. At our Lockwood (Hamden), Valley Lab (Windsor), and Griswold farms we planted *Phyllostachys aurea* (Golden fishpole bamboo), *P. aureosulcata* (Yellow groove bamboo), and *P. aureosulcata* spectabilis (Spectacular bamboo) in the spring of 2012. We are comparing the growth (height and number of culms or canes) and rate of spread (distance from original planting) of each species/cultivar when not controlled with the options of (1) periodic mowing around plantings and (2) containing the rhizomes with heavy plastic liners. In the first two years, new culms were observed growing 2-10 feet from the original plantings. We will continue to monitor these plantings in the coming years.

Herbicide trials – In 2012, we began an experiment at three locations to examine whether cutting followed by herbicide sprays would control dense, established bamboo stands (Table 1). All clones were cut to reduce height of culms, reduce leaf density, and weaken starch reserves in roots.

The much shorter (1-6 ft tall) new culms that grew after cutting were treated with 2% glyphosate foliar spray (5oz/gallon of a 41% concentrate, 2.0% solution)<sup>4</sup> in late August or early September and again two weeks later. The foliage was sprayed until wet using glyphosate. Sites were visited on June 6, 2014 to locate surviving and/or new culms.

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<sup>2</sup> <http://www.flowersplantsinct.com/pdf/Bamboo-Tag.pdf>

<sup>3</sup> Miller et al. (2010) A management guide for invasive plants in southern forests. USDA Forest Service Gen. Tech. Rep. SRS-131.

<sup>4</sup> Mention of a product or company is for informational purposes only and does not constitute an endorsement by The Connecticut Agricultural Experiment Station.

At the MRT and OFR study sites, all old culms were dead and a several new culms emerged. These new culms were treated in a couple of minutes with an additional herbicide spray – all died and no new culm emerged. At Merritt where a quarter-acre stand was treated, several culms remained green on the lower stem and there was a single new stunted culm cluster. The Merritt plot suggests that running bamboo can be effectively treated by cutting and applying herbicide in a single growing season. While control was nearly 100%, treated areas should be checked after herbaceous plants have died in late October to spot any small *Phyllostachys* that may have emerged. These can then be easily killed with a spot treatment of glyphosate.

Table 1. Results of a running bamboo control study in Connecticut

	MRT	OFR	Merritt Parkway
	Woodbury	Woodbury	Easton
Original height	12-18 ft	12-15 ft	> 20ft
Date cut	9/6/2012	11/29/2012	6/6/2013
Pre-spray height	2-8 ft	2-8 ft	3-10 ft
1 <sup>st</sup> spray	8/31/2013	8/31/2013	9/5/2013
2 <sup>nd</sup> spray	9/13/2013	9/13/2012	9/19/2013
Effectiveness	99%	100%	99.9%
3rd spray	11/24/2014	Not needed	
Effectiveness	100%		



**MRT study area in September 2012 prior to cutting dense infestation of running bamboo.**



**MRT study area in August 2013 prior to first herbicide treatment. Note that the new culms are much shorter and easier to treat.**



**MRT study area in June 2014. All the green plants are herbaceous, most are native wildflowers. Some dead bamboo can be seen in the background.**

## CGS 22a-281e with changes of PA 14-100 and PA 16-89

Sec. 22a-381e. Prohibited actions re running bamboo. Disclosure statement. Penalties. Enforcement. (a) For the purpose of this section, "running bamboo" means any bamboo in the genus *Phyllostachys*, including *Phyllostachys aureosulcata*.

(b) No person who plants running bamboo or who allows running bamboo to be planted on his or her property shall permit such bamboo to grow beyond the boundaries of his or her property. On and after October 1, 2013, any person who violates the provisions of this subsection shall be liable for any damages caused to any neighboring property by such bamboo, including, but not limited to, the cost of removal of any running bamboo that grew beyond the boundaries of his or her property.

(c) No person shall plant running bamboo or allow running bamboo to be planted on his or her property at a location that is forty feet or less from any abutting property or public right-of-way. Any person who violates the provisions of this subsection shall be fined one hundred dollars. In the case of a continuing violation, each day of continuance shall be deemed a separate and distinct offense until such time as such bamboo is removed.

(d) Each retail seller or installer of running bamboo shall provide to each customer who purchases running bamboo from such seller or installer a statement that discloses that running bamboo is a fast growing plant that may spread if not properly contained and a plain language summary of the provisions contained in subsections (b) and (c) of this section. Such statement shall also provide recommendations, based on best available information, on how to properly contain running bamboo. Any retail seller or installer of running bamboo who violates the provisions of this subsection shall be fined one hundred dollars for each plant sold in violation of this section.

(e) The Department of Energy and Environmental Protection, any duly authorized municipal constable, municipal tree warden, zoning enforcement officer or inland wetlands and watercourses enforcement officer may enforce the provisions of subsections (c) and (d) of this section.

(f) Allowing running bamboo to grow beyond the boundaries of a parcel of property that a person owns shall be deemed to be a nuisance.

