

JIM BLEW: Have you tried twin scaling with your bulbs?

JIM WELLS: No, I have not tried it. It is quite easy. You just slice a bulb up into 8 or 16 sections in August or September, dip in Benlate for ½ hour, place them in a plastic bag with damp peat or vermiculite, and leave them for 2 months. Little bulbs will develop on the edge of the scales and basal plate. You can plant them and they will grow.

A SURVEY OF HARDY BAMBOOS: THEIR CARE, CULTURE, AND PROPAGATION

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Bamboos belong to the Bambusoideae division of the grass family, Graminae or Poaceae. Some people have given the name "tree grass" to bamboo because of the giant size they can attain, especially in the tropics and subtropics. Since some bamboo species only reach a maximum height of 18 to 24 in. (and some varieties even less), the "tree grass" name is not appropriate for all bamboos.

There are two main divisions in the bamboos based on rhizome habit. The clump growers, or pachymorphs, have constricted rhizomes so that the plant remains in a relatively tight clump. Although the clump increases in size over the years, its increase per year is generally measured in inches rather than feet. The other group, the leptomorphs or running bamboos, spread rapidly by vigorous rhizomes which can extend out from the parent plant several feet, or more, per year. For garden purposes, the clump growers are more desirable, but, generally speaking, they are the tropical or subtropical species. On the other hand, those species that are hardy in the temperate zones are the runners. Fortunately, there are two species of pachymorphs or clump growers which are hardy and therefore valuable garden subjects, especially since they are hardy even in the Boston area. I refer to *Sinarundinaria nitida* and *S. murielae* (also known as *Thamnocalamus spathaceus*).

There are many species of hardy bamboos of the runner or leptomorphic type, ranging in height from the low growing 18 to 24 in. species to the giants of 60 ft or more. The hardiness of this group varies, but by creating microclimates and by changing our expectations, one can still grow some of these bamboos in colder areas.

Before I can explain how a bamboo grows, I need to describe and identify the plant parts. Bamboos have three main parts: the

above-ground stem with branches and leaves, called culms; the underground stem-like structure called rhizomes; and the roots which are attached to the rhizomes. The culms and rhizomes have nodes and internodes. The actively growing rhizomes have a terminal bud, and at each node are one or more buds which eventually develop into culms.

In my opinion, bamboos provide us with one of the most amazing growth habits in the plant world. I will describe the growth habit of the widely known *Phyllostachys* genus to illustrate my point. Bamboo culms do not have a cambium layer or a terminal bud. This means that each culm reaches its full height and circumference within its growing period, never growing any taller or broader in succeeding years. However, in any given healthy plant, each year's new culms generally grow taller and larger in diameter than the previous year's culms. The fact that the culms develop and reach their full size in a rather short period of time, perhaps 4 to 6 weeks, is truly amazing, especially if the culms reach a height of 20, 30 or 40 ft, or more. In other words, a culm, depending on the species, will reach its full height in a matter of weeks, which means growth can be measured in terms of inches, or even feet per day, as in the case of culms which may ultimately reach 60 ft. As for the other genera and species of bamboo, the growth habits are the same, remembering that when the plant reaches its maximum height, new culms will only attain that height.

Taxonomically, bamboos are named, as are all other plants, on the basis of their flowers. A phenomenon that is unique to bamboos is that they very seldom bloom. Some species produce flowers only every 75 to 100 years. This makes it difficult for the taxonomist to accurately study and classify the bamboos. Fortunately for the botanists there are certain vegetative characteristics which can help identify the species. As for the *Phyllostachy* spp., they can be told apart relatively easily at the time of shooting. A key exists to assist the interested person to identify the various *Phyllostachys* spp. growing in the United States.

Bamboo species vary in hardiness. There is little literature listing precise hardiness of the many species of temperate bamboos. Some species not hardy in colder regions may still survive and even thrive if planted in a modified microclimate. Some species may survive even though the current year's culm growth is killed to the ground. The key for survival in these situations is the protection of the rhizome against winter kill. If enough mulch is added on top of the rhizomes, the plant can persist. Bamboos hardy at Bluemount Nurseries are listed in Table 1.

The propagation methods of bamboo are rather limited. The three primary methods are: by bare-root rhizome sections, by removing existing culm growth with a ball of soil to include a part of the rhizome and roots, or by dividing rhizomes from pot-grown

Table 1. List of bamboos hardy at Bluemount Nurseries, listed according to maximum height attained at Bluemount

Species	Comments	Size (ft.)
<i>Phyllostachys nuda</i>	hardiest	30 to 35
<i>P. dulcis</i>	hardiest	30 to 35
<i>P. bissetii</i>		25
<i>P. decora</i>		20
<i>P. aureosulcata</i>		15
<i>P. aurea</i>	dies to ground in severe winter	8
<i>P. nigra</i>	dies to ground in severe winter	8
<i>Semiarundinaria fastuosa</i>	slow grower, very hardy, seldom shows leaf burn	15 to 20
<i>Pseudosasa japonica</i>	dies to ground in severe winter	15 to 20
<i>Sinarundinaria nitida</i>		8 to 10
<i>Thamnocalamus spathaceus</i>	clump grower very hardy	8 to 10
<i>Sasa palmata</i>		4 to 6
<i>Shibatea kumasasa</i>		4
<i>Arundinaria viridi striata</i>	very hardy, deciduous	4 to 4
<i>Sasa veitchii</i>	very hardy	2
<i>Sasa pygmaea</i>		2
<i>Arundinaria variegata</i>		2

plants. At Bluemount Nurseries, we have tried side-branch cuttings under mist and layering with no success. Some researchers are experimenting with tissue culture and cuttings, but report limited success.

In order to propagate bamboo by rhizome sections, it is necessary to carefully dig the rhizomes in late winter or early spring and cut the rhizomes to include a 2-node section. The rhizome section must not be allowed to dry out, even for a short period. We plunge the rhizomes immediately in a tub of muddy water and pot or replant the sections as soon as possible. We actually have greater success in digging B&B for transplanting than we have in planting rhizome sections. We dig any time of the year, except during the 4 to 6 week period when the bamboo is shooting, which for most species is in late April or early May at Bluemount Nurseries. Once dug, the plants should be hardened off. We have dug successfully in mid-summer by keeping the newly-dug plants in the shade and syringing the foliage several times a day for several days. We do not dig bamboo during shooting because the new shoots (culms) are very brittle and can easily be broken off.

Dividing pot-grown bamboo is relatively simple and very successful. The culms are separated with rhizomes and roots attached, repotted immediately, and protected until established.

Bamboo requires little care in the garden, once established. I

recommend spring or summer planting rather than fall planting so that the rhizomes or culms can be established before winter. Usual horticultural practices generally result in a good survival rate. Bamboo tolerates a deep mulch and generally do not require additional fertilizer once established.

A word of caution. The running bamboos are very vigorous and can spread quickly into areas where they may not be welcome. It is, therefore, best to contain these types. My recommendation is to bury fiber glass panels at least 30 in. for the taller growing types and 8 in. for the shorter growing varieties.

USING SPUNBONDED FABRICS FOR COLD PROTECTION

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INTRODUCTION

Plastics and textiles have played an increasingly important role in the continuing search for better ways to grow nursery crops. Continuous films of clear plastic have replaced glass throughout the industry. Woven polymer shade cloth provides reduced heat and light to sensitive crops, is easier to handle and has become less expensive than wooden lath. Milky white plastics have become an integral part of winter protection for container nurseries. Insulating plastic foams and laminates help nurseries overwinter more valuable or delicate stock.

Today, we are often pumping water through plastic pipe and nozzles onto plants in plastic pots on a plastic groundcover with plastic protection between the plant and the sky. Polyethylene, polypropylene, polystyrene, etc. have become familiar terms during the polymer revolution that has captured us in the past 20 years. This rapid change has occurred because the nurseries must use technology that will perform required tasks as well as or better than existing technology, at the same or less cost while fitting into existing nursery practices. It was all of these criteria that led us to investigate ways that spunbonded fabrics might be used in North Carolina mountain nurseries.

Spunbonded fabrics. Spunbonded fabrics differ from other porous polymers in that they are not woven into a regular, uniform pattern like shade cloth. Spunbonding is a continuous process in which a polymer, or several polymers, such as polyester, poly-