

# Cold-Hardy, Non-invasive Bamboo via Tissue Culture Propagation®

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## INTRODUCTION

This poster outlines the basic steps of producing cold-hardy non-invasive bamboo via tissue culture propagation. Exact protocols are not included, as this poster is introductory in nature in effort to simplify the process for interested parties. Lab preparation and tissue culture propagation of the BambooSelect® line is conducted via an exclusive propagation license with North American Plants, LLC located in Lafayette, Oregon.

Tissue-culture propagation of bamboos leads to very uniform, vigorous, and robust liners. The protocols ensure the plants are disease-free and true-to-type propagation. Crop time is greatly reduced compared to traditional vegetative division or from seed. Micropropagation (in-vitro tissue culture) of cold-hardy non-invasive bamboo via axillary branch cuttings is the best method for mass production of uniform, vigorous clones with unique landscape potential as an evergreen grass as an elegant specimen, privacy screen, or hedge.

## STEPS IN THE PROCESS

**Step One.** This shows a photograph of the mother plant field trials (Fig. 1-1). The BambooSelect line produced in the United States results from selection of elite clones from field trials conducted in Belgium by Jan Oprins of Oprins Plant NV during the 1990s. (Some of these came from seed, others from various importations from China.) The plant line in the U.S.A. is exclusively from the genus *Fargesia*. Selection of superior clones is an important accomplishment of BambooSelect, as several genotypes of the various species have been introduced with no known origin.

**Step Two.** This shows a photograph of a branch with multiple branch compliments (Fig. 1-2) of *F. rufa* 'Oprins Selection', Green Panda™ hedge bamboo. Propagation begins with cuttings selected from axillary buds. This is also a very important aspect of the process, as somatic embryogenesis is another option but leads to genetic diversity in the resulting crop. The advantage of clonal material (via axillary buds) is that the crop is uniform and predictable, sharing the same characteristics as the superior mother plant (clonal fidelity as well as true-to-type propagation).

**Step Three.** Here we show a photograph of the young cuttings in sterile media in jars in the environmentally controlled growth chamber (Fig. 1-3). This is the stage (typically called Stage 2) where a myriad of conditions are controlled for reliable, reproducible results. Temperature, light intensity, hours of light, media recipes, transplant days, etc. are all vital aspects of protocols that lead to success in multiplication and subsequent rooting (credit goes to Johan Gielis and Jan Oprins for their team research at the University of Gent, Belgium).



**Figure 1.** Cold hardy, non-invasive bamboo via tissue culture propagation.

**Step Four.** This shows a photograph of the rooted plug (Fig. 1-4). The protocols of successful rooting also depend on specific cultural conditions, some aspects of which vary from species to species. Some are rooted while still in-vitro, others are rooted directly in the peat-mixed media.

This crucial step is essential to potting success, as the liners are ready to expand into larger soil volumes and display the incredible vigor of juvenile plants. Especially so since they have been growing for approximately 4–5 months in jars with everything they need for maximum health. By the very nature of the in-vitro process, the bamboo plug liners are disease-free and genetically identical to the parent plant. The resulting potted plant develops uniformly and vigorously, greatly reducing crop time compared to traditional vegetative division or from seed.

**Step Five.** This step shows a photograph of the finished product, a uniform crop of vigorous dense clumps of dark green foliage in nice proportion to the pot size (Fig. 1-5). Short dense clumps have the benefit over taller, fewer stemmed plants by having reduced risk in shipping.

Pot size can be variable depending on the end-user; larger containers up to 15 gal (or up to 40 L) can be produced for landscape clients, whereas smaller containers ranging from 1- to 3-gal pot sizes (5 to 10 L) are more desirable for garden centers and box stores. Obviously larger plants have a longer crop time and demand a larger price tag; smaller plants can be finished relatively quickly (within a year) and fall into a more comfortable price range for the average homeowner (and still be profitable for the grower). Step Five also shows the inclusion of the finished product bearing the BambooSelect label, which is colorful and informative for both the employee at the point-of-purchase, and for the shopper needing cultural information. The marketing partnership is a very important one, and the team behind BambooSelect strives to connect the growers, buyers, sellers, and homeowners with everything to ensure success in growing these non-invasive clumping bamboos.

**Step Six.** This shows a photograph of a sample residential front entrance-way displaying a beautiful *F. robusta* 'Pingwu', Green Screen™ hardy blue bamboo in an appropriate landscape setting (Fig. 1-6). Simply as a specimen plant, these bamboos are a step above hardy grasses — they are evergreen and shade tolerate. As a hedge, they have a unique and attractive texture, moving with the slightest breeze. They create a green, lush privacy screen. Unlike the ubiquitous arborvitae, yew, or hemlock hedge, these bamboos are not a favorite food of deer or prone to insect infestation. Once established, they are drought-tolerant and do not require pruning or chemical applications. Heavy snows may weigh down snow-laden stems, but bamboos bend rather than break. We are confident the demand for these plants will only grow as architects and homeowners see the advantage of this evergreen grass as a specimen, as a screening plant, or as the “not your average” hedge.