

## Outdoor Mist Propagation

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### INTRODUCTION

Over the last 35 years Angelica Nurseries has grown to its present size of approximately 2,000 acres. Along with the increase in acreage and production has come a need for large quantities of high quality rooted cuttings.

In our propagation department we produce nearly 90% of our own plant material by cuttings, seed, and grafting. Our annual rooted-cutting production is nearly 750,000 of which 500,000 are rooted in outdoor mist beds.

Our system of propagation is exceptionally well suited to our production needs. It is a low-cost, highly efficient method of producing large numbers of high quality, uniformly rooted cuttings

### MATERIALS AND METHODS

The construction of the outdoor rooting beds is very simple. The materials needed are 8-ft fence posts, treated 2x4s, reed matting (6 x 25 ft), railroad ties, concrete sand, 1/2-in. crushed stone, 4-mil plastic, 4-in. perforated drain pipe, mist line with sprinklers, misting controller, and time clock.

Site selection is very important. Ideally the location should be relatively level, well drained, and, if possible, protected by a windbreak. Our mist bed is protected by a tall evergreen hedge on two sides. Bed dimensions can vary to suit the need of the individual grower. A 6- x100-ft bed works well for us. The beds are grouped in pairs, giving us better use of the available growing space.

Once the bed has been laid out, a 24-in. deep trench is cut in the center of each. The drain pipe is placed in this trench and the trench is filled with 1/2-in. crushed stone. The lower end of the drain pipe is routed to a field drain of suitable size to handle the flow from heavy rains.

A layer of 4-mil plastic is placed across the pair of beds and cut open over each drain trench. At this stage the railroad ties are placed in the proper location and the plastic is covered with a layer of one-inch crushed stone. Concrete sand is then added to bring the level to the top of the ties.

Fence posts, 2 x 4s, and reed matting are finally installed to provide a wind barrier so that the mist from the sprinklers falls uniformly on the bed. The mist line is placed next to the central row of railroad ties. Mistlers are spaced 8-ft apart. We are using a mist controller with six zones that is activated by an on/off clock.

### PROPAGATION PROCEDURE

The first plants to be prepared for outdoor rooting are *Taxus*, *Juniperus*, and *Thuja*. We do this during the month of March. We collect the cuttings well in advance of preparing them and store them in our cold-storage building at 34°F. When the weather makes it unfit to work outside, we move indoors and start preparing the cuttings. We strip off the lower needles, cut to 6-in. length, and bundle into bunches of 50 cuttings that are secured with a rubber band.

Once bundled, the cuttings are placed in plastic bags and stored in our cold storage facility at 34°F until sticking time, generally between April 15 and May 1.

Prior to sticking, the bundled cuttings are dipped in a solution of Dip 'N Grow for 10 sec. The solution strength varies from 1000 to 2000 ppm depending on the genus.

*Thuja* are stuck at a 2- × 2-in. spacing, and *Taxus* and *Juniperus* are stuck at a 1 1/2- × 1 1/2-in spacing. The sticking depth is 1 1/2 in. A board with nails placed at the correct spacing, is used as a template to mark the spacing on the moist sand.

From the time the cuttings are stuck until they are well rooted, keeping the foliage moist is of prime importance. Misting duration and interval vary with the daily weather conditions. We check and adjust mist settings every hour. Cuttings are allowed to dry slightly in the morning before the mist starts, and again in the evening by shutting the mist off about one-half hour before sunset. This limits the spread of disease.

We complete all of the softwood cuttings within a three-week period. We root many of our deciduous shrubs at this time—*Viburnum*, *Euonymus alata* 'Compacta', *Hamamelis*, *Berberis*, and *Platanus × acerifolia*—to name a few. Deciduous plants are collected in the early morning while fully turgid and are prepared the same day. The leaves are trimmed to allow plants to be stuck at a 2- × 2-in. spacing. All cuttings are wounded with a triple-bladed razor. The wound is approximately 1-1/2-in. long and is made on two sides of the cutting.

Finally, we prepare our *Ilex* cuttings during the last week in July. *I. × meserveae* and *I. × aquipernyi* cultivars are taken at this time as well as *I.* 'Nellie R. Stevens'.

Dip 'N Grow is again the hormone of our choice for *Ilex* and shrubs, at 1000 to 2000 ppm. The prepared cuttings are stuck the same day they are prepared. Rooting takes from 4 to 14 weeks. Deciduous plants root very quickly. The evergreens, *Taxus* in particular, are much slower. After rooting we apply 8 lb per 1000 sq ft of Sierra 17-6-12 plus minor elements.

## OVERWINTERING

*Taxus*, *Thuja* and *Juniperus* are all well rooted by late November. We cover these with a light layer of loose salt hay. *Ilex* and deciduous shrubs are covered with a thermal blanket of straw sandwiched between two layers of 4-mil poly. Both groups of cuttings are uncovered about March 1. Once the deciduous plants are uncovered, it is important not to let them freeze before they are pulled.

**Spring Planting.** All cuttings of deciduous shrubs are pulled in the spring, before budbreak, and are placed on a long strip of plastic. The roots are covered with moist peatmoss and the plants and plastic are rolled up jelly roll style. This bundle is then stored in cold storage at 34°F until planting is possible, sometimes as long as 2 1/2 months from the time they are pulled.

*Ilex*, *Taxus*, *Thuja* and *Juniperus* are pulled at planting time (around May 1). By that time they have an extensive root system. Rooted cuttings must be kept moist after pulling. We use peatmoss bags to keep them from drying out. Cuttings are immediately planted in beds in the field using a 3-row onion planter, which plants 50,000 cuttings per day. In three years time, our *Taxus* is about 8 to 12 in. tall and ready for transplanting.

**Sandbed Reconditioning.** After all cuttings are removed, approximately 4 in. of sand is taken out of each bed. Fresh sand is added with a front-end loader just before each particular type of plant is stuck. The sand we use is very clean and using it immediately limits weed problems.

**SUMMARY**

Outdoor mist propagation is an inexpensive, highly efficient method of producing large quantities of high quality, uniformly rooted cuttings. This is the first and one of the most important steps in producing high-quality landscape plant material.